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ABSTRACT

The manual discusses the role of aids in helping intellectually handicapped persons function as independently as possible. An introductory chapter considers the notion of intellectual aids as tools that people use to facilitate their interaction with the environment. Interaction is further conceptualized in terms of a goal-directed will, awareness of available options, and ability to perform the action. Types of aids are then described for the following areas of functioning (sample sub-areas in parentheses): time (schedule planning, punctuality); public transport (bus routes, fares); leisure activities (leisure interests, music); money and personal finances (budgeting, financial transactions); shopping (business hours); meal preparation (planning, learning to cook); laundry (motivation, ironing, clothes storage); and problems in public places (public lavatories, coded locks). (CL)

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AIDS FOR THE INTELLECTUALLY HANDICAPPED

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AIDS FOR THE INTELLECTUALLY HANDICAPPED

The requirement, and some ideas

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FOREWORD

The Swedish Institute for the Handicapped is the central body dealing with aids for the handicapped in Sweden. Our primary task is to initiate research and development in the field of aids. We are also responsible for testing and recommending aids, spreading information and arranging courses about these questions.

The intellectually handicapped are not well supplied with aids and there is a considerable need for supportive measures. Little research has been conducted into aids for this group. After consultations with the authorities and bodies concerned, the Swedish Institute for the Handicapped gave the research foundation ALA (Adjustment to Life and Work) the task of carrying out research, with the aim of producing a multi-disciplinary basis and a definition of the problems in the area of aids for the mentally handicapped. The point of departure was the psychological/pedagogical view of man and the intellectually handicapped, which was developed at the ALA under the leadership of Professor Gunnar Kylen.

The Swedish Institute for the Handicappped has published two documents to date as a result of work on this project: **The Intellect and Intellectual Handicaps, by Gunnar Kylen** and **How Our Understanding of Reality Develops, by Kerstin Göransson.** These two documents contain general, basic theoretical knowledge which we consider to be essential for everyone who works with intellectually handicapped people.

If the aids which have been developed and made available are to have any positive effect, a considerable number of interlinked factors in intellectually handicapped people's total environment must be changed. This document is an attempt by the Swedish Institute for the Handicapped to present the view which we, on the basis of a holistic view of the intellectual handicap, its character and effects, have chosen as the basis for developing and designing various supportive measures in the form of aids.

This document has been produced by Kerstin Göransson, research assistant, and Lena Hedman-Hallin, remedial teacher, at the research foundation ALA (Adaption to Life and Work). Unless otherwise indicated in the text, the authors have based their work on a level of intellectual handicap corresponding to the B level.

By indicating the type of problems that occur in everyday situations in association with intellectual handicaps, we hope that the readers of this document will acquire **ideas and knowledge** which will help them to design different types of supportive measures aimed at giving intellectually handicapped people the greatest possible independence. The situations described here should be regarded as **representative examples.** A collection of such examples can be made far larger simply by adding anything that in any way may be considered to be a support for people with intellectual handicaps. Personal assistance and other pedagogical and technical measures can be used in different ways to suit the environment, the individual and the situation.

The Swedish Institute for the Handicapped considers the psychological-pedagogical approach presented as here as a useful one in understanding the need of aids for the intellectually handicapped. In our opinion, the practical applications which are described herein show that this approach constitutes a sound basis for future development of effective aids for the intellectually handicapped.

The Swedish Institute for the Handicapped

INTRODUCTION

Everyone has the right to live as normal and independent a life as possible. Independence means not only that people can make individual choices and decisions about what they are to do, but also that they have the opportunity of doing what they want to do. A normal life means a home of one's own, with one's own possessions, running the home oneself, some form of daily activity, a circle of friends, a chance to pursue leisure interests and live as part of the community. §Lx Man's biological and psychological characteristics enable him to live this type of normal life. We see, we hear, we can move about, understand the world around us, remember, we have a range of emotions etc. If an individual's characteristics deviate from the norm, his abilities will be affected by any change in his surroundings. Any kind of reduced function usually makes it more difficult for a person to live an independent and normal life, since the environment is designed by and for people with average characteristics. These problems can be effectively reduced by adapting both the social and physical environment to suit the individual's conditions.

We have attempted to give the intellectually handicapped greater opportunities to lead an independent and normal life by making available to them various kinds of human resources in the form of teachers, care staff, psychologists, social welfare officers, etc., who provide various kinds of support and help for the intellectually handicapped. In other words, we have tried to adapt the social environment of retarded people to accommodate intellectual handicaps. We still have a long way to go in terms of adapting the physical environment to the intellectual handicap. In this area, the process of adaptation has tended to be the reverse, that is to say the mentally retarded individual has to adjust to "our" physical environment. The development of special aids for the school for handicapped children run by the National Centre for Educational Aids (RPH-sär) is, by and large,

the only attempt that has been made to adapt the physical environment to the handicap. A comparison with other handicapped groups reveals a marked difference. In the field of physical disabilities, for example, specially designed railway carriages have been developed, buses which can take wheelchairs, low kerbstones, cars, kitchen equipment, etc. These aids give the physically disabled a greater chance of leading an independent life. There are, practically speaking, no corresponding aids for the intellectually handicapped.

AIDS -
INTELLECTUAL AIDS

In his report, Interaction between Handicap and Aid, (see list of publications), G. Kylén sets out the philosophy for aids which forms the basis of this document. This chapter contains a summary of his report.

The word 'aids' usually brings to mind equipment such as wheelchairs, hearing aids and so on. Aids are referred to as technical and pedagogical, that is to say aids are classified by their caharacteristics or properties. The few aids available for the intellectually handicapped are the tipping board, hoists, specially designed chairs etc.; aids that are not designed specifically for people with an intellectual handicap, but for people with some other disability. In other words, aids have been "borrowed" from other disabled groups for use with intellectually handicapped people with other handicaps like partial disability.

In some instances, efforts have been made to adapt the aid to the intellectual handicap. In doing this, only **one** aspect of the problem has been dealt with; namely the need to adapt so-called normal handicap aids to suit the needs of intellectually handicapped people. The other aspect is the need for aids designed specially for the intellectual handicap itself. Since an intellectual handicap means, among other things, that the individual has a different concept of reality , the aid must in some way serve to help the individual to understand reality so that he can control his actions and perform whatever action he should wish. Aids for the intellectually handicapped, ie, intellectual aids, can, when compared with aids used by other handicapped groups, seem to have unusual designs and purposes.

The concept of aids

Human beings possess certain characteristics and abilities which enable them to satisfy their needs by interacting with their environment. The material basis is found in man's ten organic systems:

skin and mucous membrane
the motory system
the digestive system
secretion
circulation
respiration
hormone activities
the reproductive system
the nervous system
the organs of perception

The "physical standard" of our bodies limits our ability to perform certain acts. For example, we cannot fly like birds but we are, as human beings, equipped to receive certain stimuli and perform certain actions.

If these abilities are to be used at a higher level than the purely instinctive, our organic systems are required to convert the signals received by our senses to meaningful experiences that tell us something about our own bodies and about our surroundings. These experiences are evaluated, ie, they are perceived as having a positive or negative value so that emotions can develop; a precondition for the development of desire and motivation. This is what is called man's psychological characteristics, that is to say, the ability to develop knowledge and emotions which will subsequently direct our actions.

In G. Kylén's personality structure, man's psychological characteristics fall into eight groups:

- sensory experiences
- intelligence
- knowledge of both oneself and the external environment
- emotional and needs status
- the processing of emotions
- attitudes, ie, the evaluation of oneself and the external environment
- decision-making processes
- actions

The extent to which human beings can interact with their environment is determined by biological and psychological characteristics, and human beings use a range of tools to enhance these characteristics and thereby facilitate interaction. These tools are what we call aids. **Aids are tools which are used to enhance man's biological and psychological characteristics to facilitate interaction with his environment.** Instead of describing an aid on the basis of the design of the instrument, one can classify it on the basis of the biological or psychological resource that it affects.

It is thus possible to make a biological or psychological classification of aids, grouping them under headings such as respiration aids, circulation aids, aids which affect the nervous system, perception aids, aids to knowledge, intellectual aids, etc. The groups of aids formed under these headings are not mutually exclusive, but serve to emphasise different aspects of the instruments we use.

There may be many reasons why a person is unable to carry out a certain action without help. An intellectual handicap is only one of many possible reasons; others can be a lack of self-confidence, a lack of interest, a lack of relevant experience, some reduction in a biological function, etc. One frequently finds a combination of reasons and it is difficult to determine what it is we should concentrate on trying to support and improve.

INTELLECTUAL AIDS

Intellectual aids are the tools human beings use to enhance their intellectual resources to help interaction with the environment.

The intellect shapes our concept of reality. It may be said that we understand our environment and our surroundings by means of the intellect. It is fed material provided by our senses, and on this basis the intellect forms conceptions of space, time, quality, quantity, and cause and effect. In addition, the intellect develops an understanding of symbols, beginning with the understanding that pictures and speech symbolise something real, and subsequently develops an understanding of the written word. Our conception of space allows us to find our way from one place to another; we can differ between here and there, in front of, behind, on, in, beside, over, under, north, south, different countries, the world, the universe etc. Our conception of time develops the understanding that events occur in a certain order and have a certain duration; the difference between now, then, after, next, tomorrow, an hour, months, years, historical time and the future, etc. Our conception of quality allows us to group things which have something in common with each other and separate them from things which are different; to form groups of things that are similar, and understand red, hard, dog, tree etc. By using our conception of quality we can differ between much and little, one, two, three things, five kilos, one hundred Swedish crowns, understand that two plus two equals four, etc. Our conception of causes develops the understanding of cause and effect, linking two or more interdependent events.

Very briefly, one can say that the intellect allows us to understand **where** something is, **when** it occurs and **how long** it lasts, **what** it is, **how much** or **how many** it is and **why** it occurs. Thus intellectual aids are instruments we use to help us get better answers to the questions:

Where? (e.g. maps)
When/how long? (e.g. a clock)
What? (e.g. an illustrated dictionary)
How many/how much? (e.g. a calculator)
Why? (e.g. selected textbooks)

The intellect normally develops in four distinct stages. Each stage is characterised by an understanding of space, time, quality, quantity and cause, and a certain understanding of symbols. People with intellectual handicaps remain at the first, second or third stage, which are called the A, B or C stages. This means that the intellectually handicapped require special aids which give them the kind of information described above in a way they can understand, so they can acquire knowledge that will guide their actions in different situations.

In this work we have concentrated on describing various everyday problems that an intellectual handicap can give rise to. We have also attempted to suggest different aids and other supportive measures that can make handicapped people more independent. By this we mean ways to give mentally retarded people experiences that they can understand and that can help them get the basic knowledge they need before they can take the next step. An intellectual handicap affects the kind of knowledge you gain from different situations. An intellectually handicapped person can, therefore, need numerous concrete experiences, and may even need to have his attention called to what is important in a situation, before he can acquire the knowledge that a normally developed person will learn from a very limited number of experiences.

> Per will not learn that shops sell different articles simply by going shopping with someone. When shopping with Per, one must make it very clear to him that different shops sell different goods. He must then be allowed to practice deciding where different goods can be bought. Before shopping for the group, for example, there is a discussion

about what is to be bought and from which shops. Per then goes to the shop with one of the staff and buys the articles they have decided they want. The staff did the shopping on the first few trips and Per simply accompanied them. Now the roles are reversed, and it is Per who does the shopping, with one of the staff on hand in case he should need help.

The staff show Per that different articles can be bought from different shops. One of the staff does the shopping the first few times, accompanied by Per, then the roles are reversed; Per makes the purchases with one of the staff on hand in case he needs help.

The limitations an intellectual handicap places on individual independence can thus be reduced, partly by allowing mentally retarded people to gain experience from actions they understand and which are relevant to their life situation, and partly by using intellectual aids. As a rule, a mentally retarded person will develop the greatest

possible degree of independence through a combination of these two factors.

Summary: Everyone has their own individual biological and psycho'ogical characteristics which makes them relatively independent of their environment. If an individual's biological or psychological characteristics deviate from the norm, the ability to act independently will be limited. Interaction with the enviroment is made easier by the use of different tools which enhance an individual's biological or psychological characteristics. These tools are called aids.

The consequences of an intellectual handicap can be reduced by improving an individual's conditions: by giving him relevant experience, and introducing intellectual aids to adapt his environment. Intellectual aids are the various tools that people use to enhance their intellectual resources with the aim of facilitating interaction with the environment.

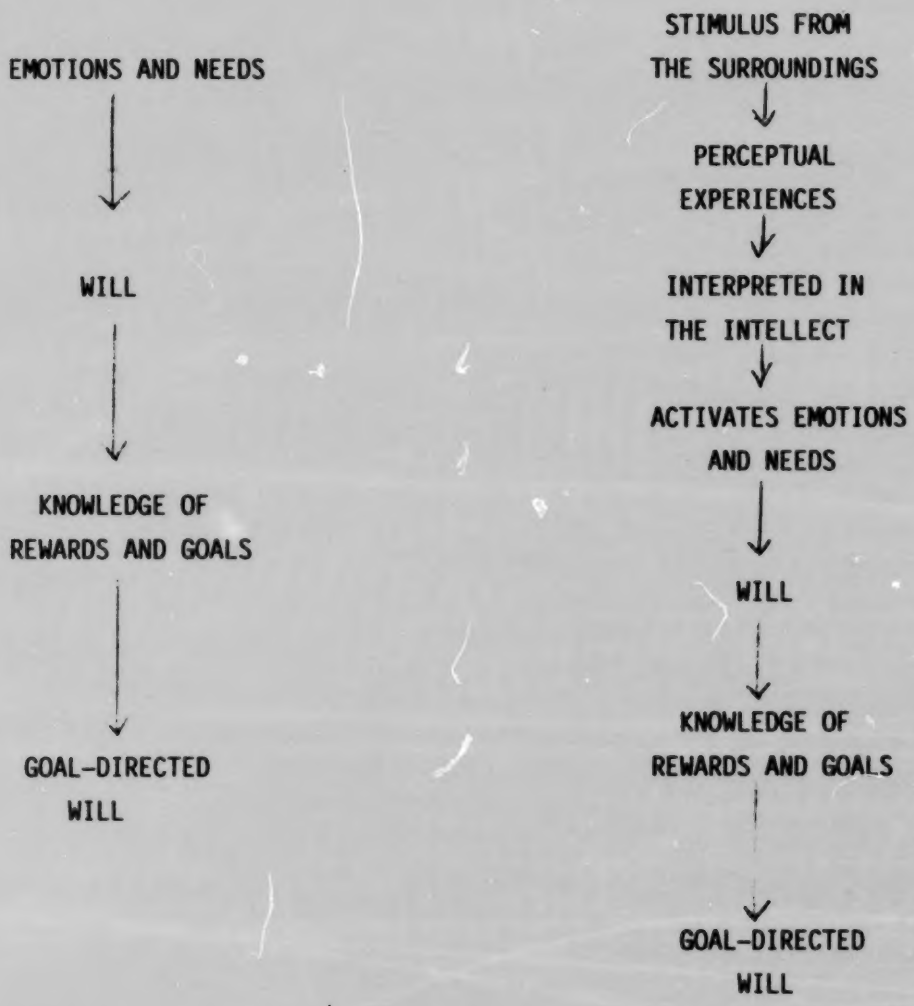
INTERACTION

The purpose of aids is to facilitate interaction, which implies not only knowledge of the personal characteristic that the aid is intended to reinforce, but also knowledge of the nature of the interaction itself. Independent action requires **a goal-directed will**, the opportunity to choose so that a **choice** of approach can be made, the ability to **perform** the action required to achieve the objective, and a **reward** which, in its turn, is an essential pre-condition of the development of a goal-directed will.

Each of the links in this chain is affected by individual psychological and biological characteristics and by the type of environment a person is in. A physical disability primarily affects the performance link. It can also affect the other links: a monotonous, unstimulating environment affects the will, which affects the other links etc. Even the intellect, which is one of the human psychological characters, influences the other links.

The goal-directed will

The will has its origins in feelings and needs, e.g. I don't want to be hungry, I don't want to be sad. Experiences, stored in our memories as knowledge, inform the will about what in the environment will provide a **reward** which changes the emotional status; e.g. food, or a friend. It may be said that the will becomes **goal-directed.** Additional stimulus in the environment which I perceive with my senses and subsequently interpret with my intellect, results in the activation of different emotions and needs which, in turn, makes me want to do something, e.g. seeing,(a sensory experience) someone I like across the road (interpretation) makes me glad (activation of an emotion) and want to run up to him (goal-directed will).
This can be illustrated in the following figure:



The will is goal-directed. Its origins are in emotions and needs. Experience stored in the memory as knowledge informs the will about what factors in the surroundings will provide rewards that will change the emotional or needs status.

A knowledge of rewards and what leads to rewards is therefore a pre-condition for the development of a goal-directed will. The knowledge one possesses is a function of personal experience and the nature of the intellect. The intellect interprets experience before it is stored in the memory as knowledge. The actual emotion, and the

strength of the will are, however, not affected by the intellect.

A reduced intellect does not affect the will, but it does, however affect the direction of the will in a number of ways: e.g. it is impossible to want to attain an objective which is beyond the scope of one's perception of reality. That is to say you can't attempt something which doesn't exist in your conception of space, time or quality, etc. The goal-directed will also requires the identification of a given objective with a given result, i.e. you must possess the knowledge that if something is done in a certain way, there will be a certain result. This ability to connect is known as the understanding of cause and effect, and is developed by the intellect. If cause and effect (action and reward) are distanced from each other in time and/or space, many intellectually handicapped people may find it difficult to connect them, and thereby find it difficult to develop a goal-directed will from that situation.

> It is difficult for Per to understand that, for example, his clean, dry clothes feel strange and have a strong odour, because he didn't rinse them thoroughly when he washed them. As he doesn't understand the significance or the result of rinsing, that is to say clean, comfortable clothes, he is not motivated to rinse the clothes properly.

Knowledge of the result of attaining a certain goal is not only won from one's own experiences of the kind of result achieved; knowledge can also be passed on to us, for example, by other people telling us what results we can expect. Information passed on to us by other people has different levels of abstraction. Written information is more abstract than spoken information or pictorial information, which is in turn more abstract than personal experience of what the consequences are when someone else carries out the action;and this is, finally, more abstract than experiencing at first hand the consequences of one's own actions.

Rewards

As described earlier, reward is crucial to the development of a goal-directed will. Rewards are both emotional and factual in nature. This means that, depending on the intellectual level, among other things, experiences are perceived as having more or less positive values. The rewards must then be adapted, at least to some degree, to suit the intellectual level. If a desire is activated by a stimulus from the external environment, an intellectual handicap can cause the sensory perceptions to be interpreted in a different or unusual way and the emotions and needs that are activated are not the same as those of people at other intellectual levels. The situation is interpreted in a different way and therefore results in a different kind of behaviour.

The goal-directed will of people with intellectual handicaps may therefore need to be reinforced by providing concrete examples to illustrate what the anticipated result of an action may be, and by illustrating the result of the action itself with concrete examples. This can be done by using special teaching methods and/or aids.

Before performing the action which is expected to attain the goal and give the desired reward, I have to decide on which approach to use, which action or actions I **choose**. The goal-directed will is weighed, among other things, against my sense of personal value and what I dare to do, i.e. what my sense of identity says I should do, versus the knowledge of what I personally can manage to do, and knowledge of which alternatives are possible - I choose from a number of courses of action and decide upon the most suitable course of action to obtain the desired result.

What are the alternatives?

Knowledge of the options available is obtained partly through experience of the consequences of ones own actions and partly through

learning from other people. As described above, information passed on by other people can have different levels of abstraction. People with intellectual handicaps often need to have information about the alternatives available presented to them in a more concrete fashion than is normally the case. This sort of information can be transferred by special teaching and/or by using aids.

> Freedom of choice may, for example, concern what to make in carpentry class, where, surrounded by planks and tools, it may be difficult to decide what to make. People in this situation can be helped by someone making a number of suggestions. However, verbal suggestions are not very effective, since people with intellectual handicaps find it hard to visualise what can be made from planks of wood. In this case, a selection of assembled models for the student to choose from can be an effective aid.

In a carpentry lesson, an intellectually handicapped person may have difficulty in conceptualising what can be made from the wood in front of him. Assembled models can be a useful aid here.

As mentioned earlier, it is not only the intellect that affects the

links in the chain, but also other psychological characteristics. When choosing what to do, it is, for example, important to know one's limitations. In other words, some self-knowledge is essential. A person may, on occasion, need help in deciding what he can or cannot manage. This has nothing to do with the intellectual handicap itself, but applies to some extent to us all.

A knowledge of alternative courses of action also affect the development of a goal-directed will in as much as it becomes more and more specific, since the results of the alternatives available can be somewhat different. Different nuances of emotions and needs can then be identified with different goals.

Performing the action

Having decided what to do, the action must be performed. Actions are performed by the motor system, directed by one's knowledge and intellect. The senses provide information about the body, e.g. a movement of the hand, and information about the surroundings. This information, interpreted by the intellect, directs the current action. Information about the surroundings may be in the form of a visual impression of a sheet of paper covered in black characters and dots which my intellect interprets as meaningful information about the price of an article in a shop; in the form of aural impressions which my intellect interprets as meaningful words, telling me what to do, etc. An intellectually handicapped person often finds the information he receives from his external environment far too abstract for him to understand. Intellectual aids can help to present information in a more concrete form. Special teaching can present in a comprehensible form information that was previously too abstract, for example by means of explanations or by having a model demonstrate what to do.

If the emotional reward of an action is to be satisfying and serve to increase knowledge, it is important that the individual performs the

action with as little help as possible, and that the action is directed by his own choice of approach and goal and not that of someone else.

> Returning to the carpentry lesson, models of an article illustrating the different stages involved in making it could act as a useful aid, allowing the student to see what to do step by step, and compare his own work with the models. The models thus help the pupil reach the desired goal. The object of the exercise is not to produce a piece of work as nearly identical to the model as possible, it is rather that the pupil should feel a sense of satisfaction and reward from the interaction involved in reaching his goal.

This document describes different problems that people with intellectual handicaps can encounter in a number of everyday situations. In some cases we have felt that a description of the entire situation in terms of the above motivation structure would be useful, particularly in situations where it may be difficult to understand the relationship between action and reward. As described above, an understanding of this relationship is essential to the development of a goal-directed will. However, when this relationship is a simple and obvious one which causes no problems for an intellectually handicapped person, we have concentrated on the problems that can occur in choosing the action and/or in carrying it out.

When difficulties arise in individual cases, the chain should be gone through step by step in order to establish the possible cause of any difficulties. In such cases, the following questions should be answered:

- Is there a lack of motivation?
  If so, is this because the person fails to understand why he is supposed to do something?

- Can the reward of the action be so abstract that it is not perceived as positive?

- How is the information about the options and their consequences presented? Can an intellectually handicapped person understand it?

- How is the information on ways of achieving the objective presented? Can an intellectually handicapped person understand it?

Summary: Independent action requires a goal-directed will, awareness of the options available, the ability to identify and select one of a number of alternative courses of action, the ability to carry out the action, and that the interchange provides a result that is perceived as positive, which is essential to the development of a goal-oriented will. The intellect is just one of many personal characteristics which will affect the different links in the sequence. Special teaching and intellectual aids can reinforce the stages of the process, so that the individual wins the greatest possible independence of action.

TIME AIDS

We form our conception of time by comparing **when** different actions occur and **how long** they last. By comparing the timing and duration of actions we observe that they occur in sequence. "First we eat, then we go swimming, and after that we go shopping" etc. The time perspective expands from **just now**, to include the past **(before)** and the future **(after)**.

Our conception of time also develops from being exclusively the product of our own experiences, i.e. **when** events take place and **how long** they last being defined by comparing actions experienced at first hand, to becoming the product of a more independent definition, i.e. **when** events occur and how long they go on for is defined by setting them against time terms that are not part of one's own actions, such as years, months, weeks, days, hours, seconds etc. It may be said that there is a transfer from a subjective to an objective conception of time.

Time is measured in terms of the relationship of the earth to the sun at any given point, and we use terms like hours, 6 o'clock etc. to describe this relationship..
Our senses alone cannot provide us with reliable information about the earth's position in relation to the sun, so we use various aids which provide our senses with information detailed enough for our intellect to interpret it as meaningful. We use, for example, sundials, clocks, calendars, stopwatches etc.

If these aids are to be of any use to us, the intellect must be able to interpret sensory experiences as meaningful information, and our senses must be able to receive this information. Many intellectually handicapped people find the information they receive too abstract to understand. We need to understand symbols, for example, before we can make any sense of the information given by a clock.

Not only must intellectually handicapped people be given information in a concrete form, but the information itself must be adapted. Information about time must be given in terms of their first-hand experience, since the conception of time at the A and B levels does not allow the concepts of when something occurs and its duration to be described in terms of time that have not been experienced at first hand.

What day is it?

We have named the days of the week so that we can mark the passage of time and be sure that we understand one another when referring to a given day. We have calendars and diaries to help us keep track of the days. Mentally retarded people at the B-level cannot read and are therefore not helped by calendars with written information on them. In addition, the names of the days of the week are abstract inasmuch as they do not stand for anything that can be perceived or experienced through the sensory organs. On the other hand, words such as 'red' and 'blue' describe something that can be directly experienced, so a calendar with a tear-off sheet for each day, and with the days of the week marked in different colours would be easier for a mentally retarded person to understand and use than a calendar which has the days marked only with semantic symbols.

Planning the weekly schedule

We use notes in a diary to get an overview of a week's activities. Many mentally retarded people would find it easier to use a diary if the written word were replaced by phootographs of themselves performing certain activities. This can be a loose-leaf file with sheets of the same colours as those used for the days of the week on the wall calendar, and photos of regular activities can be mounted on the sheets. Some mentally retarded people do not need photos, but can

understand what to do from small drawings. They can then be helped to make weekly schedules of the things they should do on different days, illustrated by small pictures. This kind of diary is also useful in helping mentally retarded people to plan household activities like cleaning house, doing the laundry and so on.

The diary

Johan atttends a special training class. He needs an aid to help him understand what he has to do on different days at school, so he has his own loose leaf file that he uses as a diary. Johan can't read, but can understand pictures and photographs and is beginning to identify different colours. Johan has been photographed in different situations during the day over a period of one week at school. The snaps have been mounted on coloured cardboard in chronological order and put in clear plastic covers. A different colour is used for each day of the week, with Monday's photographs mounted, for example, on green cardboard.

The first photograph is of morning assembly, showing Johan sitting and dicussing with the help of his diary folder what he is to do at school today. There are also photographs of the school yard at break, of him painting, of Johan at a speech therapy lesson, and having lunch in the school dining hall.

The afternoon is illustrated with snaps of Johan in the gym class, having an afternoon snack in the dining hall, cutting and glueing board, and finally a snap of Johan by the school bus after school.

Photographs helped Johan describe what he had done at school. They helped him remember and make himself understood.

After taking his diary folder home, Johan began to talk more about what he had done at school. The photographs acted as an aid to his memory as well as making it easier for him to make himself understood. Looking together at the snaps of Johan's activities during the school day helps his brothers, sisters and parents put questions to him about his school activities. Looking through the folder and talking to Johan at home also helped him to prepare himself for the following day at school.

It is important that Johan takes his diary folder home with him every day so that it is easier for him to describe what he has done at school, and it is just as important that he takes the folder to school with him the following day to help him plan and discuss the day's activities.

Punctuality

We use clocks to tell us the time so that we know when to do certain things. Since the clock's symbols are difficult to understand, many mentally retarded people are unable to use one. If they are to understand when it is time to do something, they need to have some way of telling the time that does not use the figures and/or hands of a clock. A speaking clock which tells you what the time is and what it is time for you to do would be a great help to many retarded people.

A feeling of the passing of time, that it is early morning, mid-morning, lunchtime, etc., could perhaps be developed by using an aid in the form of a clock with a face in one colour for the early morning, which changes to a second colour at mid-morning and shows a third colour at lunchtime etc. An intellectually handicapped person could then be told that it's time for his swim, for example, when the clock face is green, so that he would not feel anxious early in the morning that there would not be enough time for his swim later that day.

Tuning in to radio and tv programmes on time is not easy either if you cannot read. A timer with a range of one week, programmed to turn on the tv or radio at the right times, could be used widely as an aid for people with intellectual handicaps.

Since all information about radio and television programmes is published in written form, the intellectually handicapped need help to find out what's on. One can discuss different programmes with intellectually handicapped people and then help them programme the timer so that they can see or listen to the programmes they are interested in.

An alarm clock wakes us on most mornings. In order to set an alarm

clock, we have to understand its symbols and also understand the signs indicating the use of its control buttons. We also have to know when the next morning's activities begin, how long it takes to get to where we are supposed to be so that we can estimate when we have to leave home, and how long our morning routines will take so that, finally, we can work out what time to get up. Most of us have regular routines and get up at the same time every morning, so if we have an electric or battery powered clock, we need neither reset or wind it in the evenings - we need simply to check that the alarm button is on. Many intellectually handicapped people can manage to do that. They only need help with the initial setting of the clock. Since it is difficult for them to understand that a power cut affects an alarm clock and that it is difficult to reset a clock after a power cut, battery powered clocks are preferable.

We don't always get up at exactly the same time every morning; we can lie in some mornings, while on others we have to get up earlier. Therefore, a clock that can be programmed for a whole week could be invaluable to many intellectually handicapped people. One can discuss what the intellectually handicapped person has to do during the coming week and what time he has to get up in the mornings; one can then help him to programme the clock for the whole week and the intellectually handicapped person can then get up at the right time every day without outside help.

Planning the day

It is, of course, hard to estimate the duration of an activity when you do not understand the meaning of hours and minutes and cannot tell the time from a clock.

The sections on washing and cooking contain descriptions of how stopwatches with different coloured buttons can act as aids in these activities. Estimates of the duration of activities are also needed

when planning one's day.

> I was supposed to meet Annika at seven o'clock and she lives about half an hour's journey away, so I have about an hour and a half to spare after work. This gives me time to buy buttons for my jacket at the haberdashers' and I can drop by the chemist on the way and buy some toothbrushes. Then I can take a stroll through the town and do some window-shopping before catching the bus from the main square.

It is very difficult for many intellectually handicpped people to plan their time in this way and they need someone to tell them which activities they have time to do. The illustrated diary described above can be used to help make a rough schedule for the week, but intellectually handicapped people must, just like the rest of us, also be allowed to choose what they want to do on a whim and here the intellectually handicapped person needs someone to tell him what he can do in the time available. Sometimes a description of various alternatives may not be enough; he may need pictures to help him decide what he really wants to do.

Summary: Many intellectually handicapped people cannot understand clocks, diarys etc. This makes it difficult for them to understand when something is going to happen, how long they have to wait until it happens, how much time they have to themselves etc. The following aids are recommended to promote an understanding of time and appointments: calendars with a different colour for each day of the week, diaries large enough for photographs of daily activities, speaking clocks which tell you when it is time to do various things, clocks with coloured faces, various kinds of programmed timers which help intellectually handicapped people tune into radio and tv programmes at the right time and get up in time in the mornings, and finally, stopwatches with different coloured buttons can, in certain situations, help intellectually handicapped people judge the duration of an event.

USING PUBLIC TRANSPORT

Proper use of the public transport system requires a thorough knowledge of its scope and flexibility; in other words one has to be aware of the fact that if one wants to visit a friend or a certain place, one can get there by bus or some other form of public transport. It may be hard to understand that public transport can be used to get to many places if one's personal experience is limited to the journey to and from school or work. Many intellectually handicapped people need to confirm by personal experience that many other places can be reached by public transport. Since the aim is to teach the intellectually handicapped to link a personal wish to go somewhere to using the public transport system, the handicapped person must choose his destination himself.

One can discuss visiting different people and places, perhaps with the help of photographs, to help an intellectually handicapped person choose his own destination.

If an intellectually handicapped person is to become motivated to overcome all the practical problems he will meet when travelling by public transport, he must choose to visit somewhere he really wants to go to, and this may not necessarily be his school or place of work. He may learn more if he starts by learning to go by himself to visit a good friend, a swimming pool or suchlike.

Catching the right bus

Bus stop signs tell us which buses stop there and what their routes are. We can identify buses by their numbers, so we always catch the right bus. All this information is in letters and numbers, i.e. semantic symbols. People who cannot understand semantic symbols have to be given this information in some other way, for example, by using a colour code. Bus routes should be identified not only by number, but

by colour code, one for each bus route, with different combinations to indicate direction; out or home journey.

People with B-level intellectual handicaps can learn to recognise the numbers of buses they use regularly, provided they are always in the same style. The new luminous digital numbers are so different in design to the numbers Roger has learned, that he does not recognise them and lets the buses pass.

This kind of system could well help the intellectually handicapped find their way around the public transport system without help from other people. If buses also had coloured cards to identify their routes, they could be used as reminders, just as we note down the numbers of the buses we have to take.

Intellectually handicapped people at the B-level are in fact able to learn to recognise the numbers of buses that they travel on frequently, for example to work or school and back, but only if the bus numbers are always in the same style. If the bus number signs are made up of dots or straight lines, they will not be recognised by intellectually handicapped people because the design is so different; they will not recognise "their" bus.

> Roger is a 15 year-old student at a school for the mentally handicapped. He has learned to travel from his home to the school and back by bus. He knows which bus stop to go to and he has learned to recognise the bus number. One day his teacher was watching Roger from a nearby bus stop. He saw that Roger let several of "his" buses pass without stopping them. The teacher went over to Roger and asked him if he wasn't going home. 'Yes', said Roger. 'Well, why haven't you got on one of the buses, then?' asked the teacher. Roger's reply was that none of his buses had come yet. All the buses that Roger let pass had numbers in the new luminous digital style. The graphic impression they give is so different from the numbers that Roger has learned that he doesn't recognise them, and lets the buses pass.

Many intellectually handicapped people can only learn to recognise a few bus numbers, and learning even those few can take a long time. Their use of **public** transport is thus far more severely limited than if the information was given, for example, in the form of a colour code.

Paying the fare

Many different pay systems are in use throughout the public transport system, all of them fairly complicated to an intellectually handicapped person. One method of payment is, of course, cash, which requires the passenger to tell the driver his destination and hand over the fare.

He also needs to know, if changing buses or trains, whether his original ticket is still valid for all or part of the next stage of the journey. The bus driver or underground ticket seller, with their knowledge of the fare stages, will know how much you have to pay and will make sure that you get the right ticket. When changing buses, the driver checks the time, date and zone stamps on your ticket and tells you if you have to pay any more. Many mentally retarded people can manage cash transactions. Even if they aren't able to calculate the exact sum, they have usually learned to hand over a small denomination note, and the more complicated decisions concerning times and zones are left to the driver.

Season tickets and other forms of rebate ticket are not usually sold on the bus, train or underground. This is a problem for the intellectually handicapped because they are dependent on someone who will show them where to buy, for example, a bus season ticket. It would be easier for them if retail outlets for season tickets, etc. had the different tickets clearly displayed. The simplest solution for the intellectually handicapped would of course be to have the season tickets on sale on the bus.

Passengers have to perform various actions, depending on which form of payment they choose. The pre-paid strip of tickets that is shown to the driver requires nothing more of the passenger than telling the driver his destination; the driver decides how many tickets are to be stamped according to the length of the journey and when the strip was last stamped. Most intellectually handicapped people can cope with this.

The ticket that the passenger has to insert into an automatic clipping machine is far harder to deal with. Decisions previously left to the driver now have to be made by the passenger. He has to know how many tickets to clip, whether the last ticket was clipped recently enough to be still valid, which in turn requires an understanding of time that many intellectually handicapped people lack. Feeding the tickets into the clipping machine can also be problematic since whatever information

there is about the machine can only be understood by people who can read.

Season tickets and suchlike need only be shown to the driver. The only problem a monthly season ticket presents is knowing when the end of the month has come round, when a new ticket has to be bought. Many intellectually handicapped people have no comprehension of a period of time as long as a month. There are suggestions in the section on personal finances about how intellectually handicapped people can be helped to manage their finances themselves, by using, for example, envelopes illustrated with pictures of the most common monthly expenses such as the rent. An envelope for season ticket money would serve as an automatic reminder to buy a new ticket when the monthly salary is paid out.

A picture or some other symbol can also be used to mark the date for buying a new season ticket in one of the diaries or calendars described in the section on time aids.

Some bus companies also offer special rebates, which some county authorities use in schools for the handicapped. From the teaching point of view this is of course unsuitable, since the pupils lose the opportunity to practice using the kind of ticket they need to cope with when using public transport themselves.

When to get off the bus

Many intellectually handicapped people at the B-level have no overall conception of space. They have no understanding of the relationship of one place to another in terms of direction and distance, they perceive space in terms of places which come in a certain sequence. This means that it is often difficult for mentally retarded people to get their bearings from landmarks and learn to find their way, since they have no understanding of distance and direction. They need help in getting

their bearings.

> Anna is a 15 year old pupil at a special school for the handicapped. For the last two weeks she has caught the bus home after school, accompanied by a staff member. She and Anna discussed a number of landmarks they passed on the bus trip. The first landmark is a Domus department store, after which the bus goes through a tunnel. The third landmark is the bus terminus in a square where buses always stop to connect with other buses. The bus trip continues and Anna sees that the bus passes the church and goes up a hill. Anna has to learn that when the bus is abreast of the football pitch she has to ring the bell and get off at the next stop.

It takes longer to learn to find the way with no other help than landmarks that are passed in a certain order than by using an understanding of direction and distance to create an inner picture of the route in which the landmarks are put in their place to form a meaningful whole. Possibly a lifelike model of the town or village, complete with houses, shops, streets, trees, etc., would make it easier for a mentally retarded person to understand the relationship between one place and another. We often use maps to form an inner picture of a town or a village.

People with a reduced ability to understand spatial relationships need help in establishing landmarks to tell them when to get off the bus, and it takes them a while to learn to perform this act. When travelling on unfamiliar routes, mentally handicapped people must, just like us, learn to ask the bus driver, or one of the passengers, to tell them when to get off.

Most mentally handicapped people can manage to learn that they have to pull a cord, or press a button or panel. The link between cause and effect is simple and there is no great time lag between pressing the button and hearing the bell, and seeing the sign light up. Shortly

afterwards the bus will stop. However, when new systems are introduced, mentally handicapped people may become confused. The instructions are usually in writing. For this reason, the social welfare board for the mentally retarded, the rehabilitation committee or similar bodies should, as a matter of course, be informed of any changes that are to be introduced on the public transport system. These organisations can then inform the staff at schools for the mentally handicapped, their day care centres, etc., who will then be able to prepare mentally handicapped people and possibly even accompany them on their first few trips after these changes have been introduced.

Catching the bus

In order to catch the bus you need to know the bus times, you must be able to tell the time from a clock and have a clock available, and finally, you must know how long it takes to get to the bus stop so that you can work out when to leave your home or school. Timetables are an aid to this process.

People with mild intellectual handicaps at the C-level can both read and tell the time, so they should be able to use the information in a timetable. However, the design of timetables often prevents many of them from understanding them, one of the difficulties being that arrival times are seldom given for all the bus stops, which means that we must work out for ourselves when the bus is due at "our" stop. This is a calculation which, because it is based on sixty instead of tens, is difficult, and different symbols are used (dashes, crosses, letters etc.) to indicate whether a bus is, for example, taking a detour on a certain day, or at a certain time. Buses running a frequent service on regular routes often do not have all the times on the timetable, but only the hours when the buses are running with that frequency.

Intellectually handicapped people would be helped if the complete timetable were written out, giving all the times when buses stop at all

the bus stops, written in clear, easy-to-read figures. If buses run at different times on particular days, this information should be set out on a separate page. If all the bus stop times were included on the timetable, and if there were separate timetables for the days when buses run at different times, it is not necessary to work out when a bus is due at "your" bus stop, neither is there any need to use different symbols. Intellectually handicapped people can then put a circle round the times that the buses are due at their stop on the routes that they travel most frequently.

If you can't tell the time from a clock, then you can't understand a timetable: you have to use other information sources to help you catch a bus, for example. Either someone tells you when it is time to go, the start of a radio programme tells you it is time to catch your morning bus, or you have learnt to recognise the position of the clock hands for that particular time, etc.

A programmed clock which either sounds a tone or tells you that it is time to go to the bus stop would help give intellectually handicapped people greater independence and flexibility when using the bus service. Intellectually handicapped people could then be helped, for example each morning, to programme the clock to help them catch their buses.

Understanding the bus routes

As described at the beginning of this section, effective use of the public transport system requires you to know that there are many bus routes and that they can be used to travel to the places you want to reach. There is usually a route map available to help people see where the different routes go.

All intellectually handicapped people find it difficult to use a route map to work out how to get to a certain place, since a map requires an abstract comprehension of space, i.e. an understanding of its

structure. If an intellectually handicapped person who is at the C-level, and can therefore read, knows the name of the bus stop, he can use a simplified map, on which only the bus routes and the names of the stops are marked, to find the number of the bus he has to catch. If this kind of "map" is to be of any use, it must not have too many routes marked on it. If the traveller has to change buses, it might be hard to see on the "map" which buses to catch.

There is, however, often an "information centre" which one can call for information about how to get from one place to another. It is important that this type of information is easily accessible and understandable so that intellectually handicapped people who can read and use the telephone are able to make use of it. In information folders (timetables, maps, etc) the word information should be replaced with the more easily understandable phrase "which bus should you catch? - ring .....". This is much easier to understand, and if intellectually handicapped people at the C-level were able to find out without outside help how to use the public transport system, they would be able to lead more independent lives.

The most important condition to be met if greater numbers of intellectually handicapped people are to make more use of the public transport system is, however, that travel is simplified. This can, as has been described, be carried out by, for example, colour coding bus numbers, routes, and bus stop signs, simplifying the system of fare payment, and having bus drivers call out the name of the next bus stop.

Summary: People must be aware of the scope and flexibility of the public transport network before they can use it effectively. Many intellectually handicapped people at the B-level never think about anything they haven't experienced personally, and they therefore need first-hand experience of using public transport to travel to many different places.

To avoid intellectually handicapped people at the B-level finding the

public transport system altogether too complicated, the information we get in the form of semantic symbols from bus numbers and the notices at bus stops must be given in a different form, for example by using colour codes. The system of payment involving clipping or stamping the ticket yourself is often too difficult for intellectually handicapped people, since the act of stamping tickets calls into play time and distance factors, among others. Other problems that intellectually handicapped people meet and need help with and to have clearly explained, are bus departure times, which bus to catch to a given destination and when to get off.

LEISURE ACTIVITIES

We all need to take a break from our daily routines; no matter whether we are studying or working, we need to have some contrast between the working day and our leisure time. If we are to have a rich, varied and meaningful life, we need to complement our workday with a variety of leisure activities.

Developing leisure interests

If you are to develop an interest in a leisure activity, you need to know about the options available and what is the purpose of pursuing a particular interest. A goal-directed will is developed by establishing a link between a given feeling that leads to a desire, the knowledge of which result would satisfy the desire, and how to achieve that result. As an example, if you feel restless and have surplus energy, previous experience of similar feelings tells you that a run in the woods will often make you feel better, and less restless.

Thus it is important that a given feeling is identified with a given activity if leisure interests are to be developed. If you cannot perform the activity on your own, i.e. if you are dependent on outside help, it may not be easy to arrange the activity at just the times you want, which will in turn make it harder to develop that activity as a hobby. Instead you may choose to develop an interest which you can pursue at times that suit you, thereby remaining independent of outside help.

Many intellectually handicapped people are unable to pursue leisure activities without help, since the activities mean travelling, handling money, organising a schedule etc. It is seldom the activity itself which the intellectually handicapped person cannot manage, but the preparations, which in turn means that many intellectually

handicapped people never develop leisure interests. Running in the woods on a prepared track is not particularly difficult for intellectually handicapped people at the B-level, but it may be very hard for them to find out where the track is, how to get there, to find the right locker in the changing room, buy the necessary clothing etc.

What activities are there?

If you are going to develop an interest you must be able to perform the activities involved when you want to, which usually means that you have to be able to do them without help. If you need help, you are not fully free to pursue your hobby when you want to.

Intellectually handicapped people at the B-level never think that there might be other activities than those they have first-hand experience of. Their awareness of what activities are available is limited to those they have personal experience of. For this reason it is important that intellectually handicapped people are given the opportunity to take part in as many leisure activities as possible so that they are able to make an independent choice. Before they can form an opinion about what these activities imply, they need to have first-hand experience of them. A file of photographs depicting various activities would be a useful aid. It would give intellectually handicapped people a better chance to choose what they want to try than if they had to rely only on written and verbal information. This choice would be even easier if they were given as an aid a folder containing snaps of themselves pursuing different interests.

The other type of information, knowing what it is possible to do in a given time, means that you need to know the range of activities in your area and when they are being run. We have already mentioned that written information is too abstract for people with intellectual handicaps, they need pictorial information supplemented by verbal information. Trial projects on cable television with special

programmes for the intellectually handicapped, should include an information programme about which activities are being run by the local authority during the coming week. Intellectually handicapped people can then watch the programme with someone and choose what they want to do. The time that the activity starts can be marked by a picture or with some other symbol that the intellectually handicapped person can understand in the illustrated diary or calendar described in the section on time aids. That section also mentions that many intellectually handicapped people have difficulty in understanding time words such as 5 o'clock, on Monday, etc. To understand when an event is going to take place, they need information expressed in terms of what they themselves will be doing, before that particular time, for example after dinner, when you get home from work and so on. The difficulty in understanding time expressed as hours is the reason why many intellectually handicapped people miss activities they want to take part in.

> A school for the mentally handicapped is having a day out and various activities have been arranged for the pupils throughout the day. The morning is taken up with activities the students have entered for, a pentathlon, a cross-country run, a paper chase. After an hour for lunch students can choose their activities for the afternoon, for example, riding, or a football match. One of the pupils, Anette, has finished her lunch and has been told that the riding starts at 1 o'clock. One of the staff sees Anette after lunch sitting in the gym watching some of her friends chasing each other. When she is told it's time to go riding, she is very happy and leaves at once.

The problem in this situation is not that Anette is uninterested or lacks the will to do something, in this case riding. It is rather a question of the difficulty in knowing when various activities are scheduled and what she can do in the remaining time. She needs help in structuring her schedule in terms of named activities rather than in

stated times. In short, When pursuing leisure activities, the intellectually handicapped generally have difficulties in knowing which activities are available, in knowing where they are taking place, how to get there and, finally, when they are scheduled. They will also encounter other problems which are specifically related to certain activities.

Swimming

Intellectually handicapped people at the B-level are usually able to go to the beach and have a swim during the summer months without difficulty. A visit to the swimming pool, however, places far greater demands on the intellect. Having arrived at the swimming pool, they need to know that they have to pay to go in. If you can't read, you must learn this from first hand experience, so it is important that intellectually handicapped people are allowed to buy their own tickets when, for example, the class goes swimming. A sign with a picture of the coins needed to buy the ticket would be a better aid than the same information on a written sign. The written information about different prices is, even if one can read, very difficult to understand (season tickets, single tickets, various rebate tickets etc.), because not only does this require mental arithmetic, it requires a mental estimate of how many times one is going to visit the pool, and intellectually handicapped people then need help to decide which is the cheapest alternative.

Having paid, one enters either the men's or the women's changing rooms. Signs tell us which door to use, but the information is usually only given in the form of semantic symbols. Supplementary pictorial information would be of help to most intellectually handicapped people. Once you have selected the right door, you have to find "your" locker. The lockers are numbered, as is the key you get when you pay, and you have to find the locker with a number corresponding to the one on your key, a system which is of no help at all to the majority of

intellectually handicapped people, who need a simpler system, possibly based on colour codes and pictorial symbols.

Many intellectually handicapped people find it hard to locate the right locker in the changing rooms. A system of numbered keys and lockers is of no help to them; they need a simpler system, possibly of pictorial symbols and colour codes.

Another alternative is for every swimming baths, just as they have lifeguards, to have at least one member of the staff with the job of giving help people who need it. It should be possible to ask for assistance when you pay and then be shown how to turn the showers on and off, how the temperature controls etc. work, which can pose a problem for mentally handicapped people since there are many different types of regulators on showers, different types of button located in different places on the shower, on the floor or elsewhere, taps that

must be turned, temperature regulators, etc. In order to cope with different shower equipment, which one may never have seen before, one needs to have the ability to draw on similar experiences and an understanding of the design of the system ; an ability which most intellectually handicapped people do not possess. If there is no-one available to help intellectually handicapped people, it would be useful to have either uniform instructions for use of the showers or easily understandable symbols on the taps or buttons (similar to red or blue colour markings for hot and cold water).

Signs tell us where the swimming pool is and how to get from the swimming pool back to our changing rooms. B-level intellectually handicapped people do not understand these signs unless they are supplemented with pictorial symbols.

There is usually a large wall clock in the swimming pool so that we can keep an eye on the time. Intellectually handicapped people need their own watertight wristwatches with an alarm function to do the same job.

An interest in music

An interest in music means that you like to play some instrument and/or like listening to music. We are limiting ourselves here to describing the problems which can occur if you are interested in listening to music. The act of listening is, of course, not affected by an intellectual handicap. Simple cassette tape recorders * are available in the shops. Most intellectually handicapped people at the B-level can learn to use these simple, commercially available machines. However, buying tapes can be more of a problem. In addition to the

* Cassette tape recorders on the Institute for the Handicapped list of aids. Intellectually handicapped people can borrow speaking books free of charge from the local lending library.

general problems that arise when shopping, i.e. knowing which shop sells a particular article, finding that shop, finding the article in the shop, being able to pay, etc. (see the section on shopping), buying cassettes or records poses particular problems.

If you are to find your way around the assortment of cassettes on sale, you first need to know that they are sorted into groups by type of music (rock, classical, jazz etc.). The cassettes are sorted in these groups in alphabetical order. A well-developed conception of quality is required before one can understand which group a cassette or record falls into. In addition, the information about what type of music is on the cassette is in the form of semantic symbols. Perhaps a picture of a rock group, symphony orchestra, jazz band, etc., would make it easier for intellectually handicapped people to find the cassette they are looking for.

Finding a particular artist requires that one can not only read, but also know the order of the letters of the alphabet, which is extremely difficult for an intellectually handicapped person. They therefore need help in finding records and cassettes.

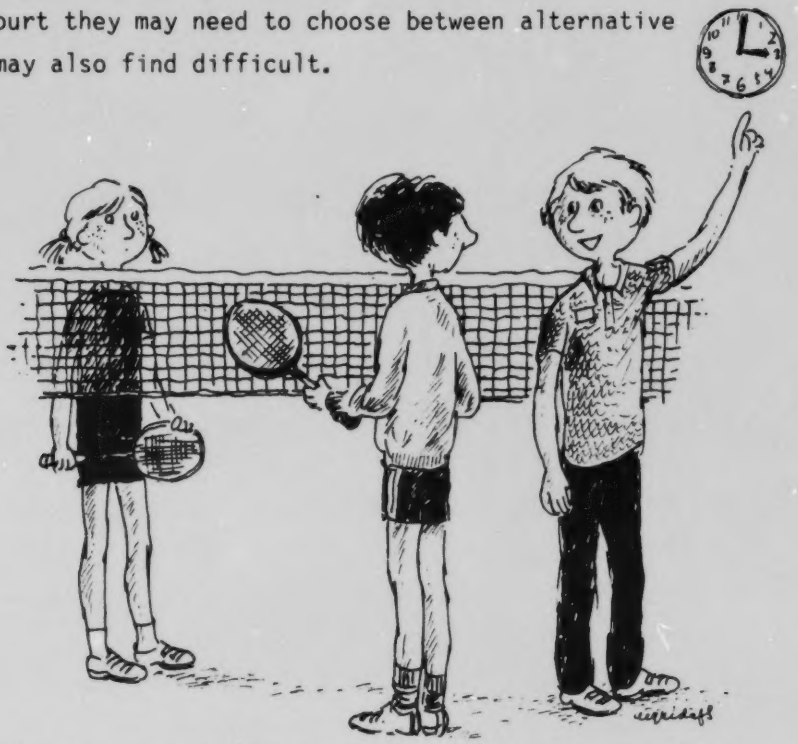
People who are interested in listening to music will naturally want to go to concerts. Once again, many intellectually handicapped people find this difficult, as the information about concerts is in written form. Another problem is finding your seat in the concert hall, for which you need to understand numbers and their sequence. That is to say, the same problem arises here as when trying to find "your" locker in the swimming pool changing room. It should be self-evident that intellectually handicapped people, just as for example, disabled people or people who are partially or wholly blind, are helped to find their seats.

Playing badminton

This kind of activity must be booked well in advance, in some cases up to six months ahead, which causes problems for intellectually handicapped people. Their limited conception of time makes it difficult for them to understand a period as long as several months, and plan that far ahead. Since a badminton court has to be booked, this is an activity that has to be performed on a particular day and at a particular time, and here many intellectually handicapped people will have difficulties in dealing with the names of days and the times of their bookings. In the section on time aids, there is a description of a calendar with colour-coded days of the week, and which is big enough to have pictures mounted on it to supplement the written information. A photograph of the intellectually handicapped person playing badminton can be fixed to the calendar, which would give an overview of the week's activities and a better understanding of when the game is scheduled. If the time booked is immediately after some other regular activity, no further definition of time is required. For example, if the booking is immediately after work, it is unecessary to know what time it is for in terms of hours or minutes: but if the booking is two hours after work, a clock is needed to keep track of the time. A pre-programmed clock which signals or tells you when it is time to leave can be a useful aid in this sort of situation.

This kind of leisure activity, wwhich has to be planned well in advance, gives rise to more problems than simply knowing when it is time to play; the scheduling itself, i.e. deciding when to play, poses problems which are further complicated by the fact that two people have to agree on a mutually suitable time. That presupposes a well-developed conception of time. One has to know how long different activities take and whether there will be enough time to fit in a game of badminton: one must be able to consider different alternatives, i.e. be able to perform thought operations of time, which is not possible for people at the B-level. The calendar described above can help to a certain degree, but intellectually handicapped people are still

dependent on help from others when deciding on a suitable time and possible alternatives if there are no badminton courts available at that time. Intellectually handicapped people often need help in booking a court, because that usually entails looking up a telephone number, which presupposes literacy; the number has to be dialed, and when booking the court they may need to choose between alternative times, which they may also find difficult.



If you can't tell the time, you don't know when your time is up. A programmed clock which sounds an alarm would be a useful aid.

Intellectually handicapped people are faced with two particular problems in the badminton hall; finding out which court they are to play on, and knowing when their time is up. The courts are normally numbered to help us identify our court and tell each other which one we mean, but somebody who can't understand numbers gets no help from being told that he is to play on court three today. If the courts were instead marked with different colours, it would be easy for many intellectually handicapped people to find the right court. Not all badminton halls have a system where you are given any court when you

book; many halls give you the same court each time, in which case intellectually handicapped people need help to find "their" court only the first, or perhaps even the second time, after which they will have learned to recognise the right court. But even here, colour-coded courts instead of numbered courts would make things easier. If you can't tell the time from a clock, it is naturally very difficult to know when your time is up. A pre-set clock signalling when your time is up could be a useful aid. Another way is for a member of the staff to be given the job of helping handicapped people, and any other people with particular difficulties. This employee could then tell the intellectually handicapped people when their time is up and also help them in other situations, for example showing them which court they are to play on.

Radio and TV

In many ways watching tv and listening to the radio are far easier activities to perform than, for example, going for a swim or playing badminton. The difficulties consist of knowing which programmes are being broadcast, and when. The vast majority of programme information is in writing which means it is of no use to many intellectually handicapped people. It would help if a programme of trailers was broadcast once or twice a week, together with verbal information on coming programmes. In Sweden, both radio and television broadcast such information, but it is not sent out at regular or announced times, but whenever there is broadcasting time available. This means that people who really need this information are unable to make the fullest use of it. This kind of programme information would also help many intellectually handicapped people get an idea of what programmes are actually about. However, the problem remains of knowing when to turn on the radio or television to catch the programme they are interested in. A programmed timer connected to the television and the radio to indicate when it is time to tune in would be a useful aid. The intellectually handicapped person can then watch the television and

listen to the radio programme information and, with help, decide which programmes he is going to tune into. He is also dependent on outside help in setting the timer, but after that can manage to see the programmes on time himself.

Summary: In order to develop an interest, a particular emotion must be identified with a particular activity. This means we must be able to perform that activity whenever we want to. If we are dependent on other people, the chance to pursue an activity whenever we want to is limited, as is the chance of the activity developing into an interest. Instead, we try to become involved in interests which we can develop without outside help.

Information about which leisure activities are available, where they are going on, how to get there and when they are taking place, must be modified so that intellectually handicapped people can make an independent choice of which leisure activities to pursue without help from other people. There are special problems associated with certain activities, but as a rule it is not the activity itself that intellectually handicapped people can't manage without help, but some of the preparations, for example finding the right locker in the swimming pool changing rooms, knowing which badminton court to play on, finding your seat in a concert hall, etc.

MONEY AND PERSONAL FINANCES

Handling money and managing personal finances is a major problem for many intellectually handicapped people. Even those who can manage to live without help in other ways, are dependent on others in this context.

The value of money

The basic requirement for managing money matters is knowing what money is. You must know how many notes can be exchanged for different kinds of goods. If intellectually handicapped people at the B-level have first-hand experience of going shopping and paying with real money, this relationship is relatively easy for most of them to understand. If, however, they are used to shopping on credit or with coupons, it would, of course, be difficult for them to understand that they need money to buy goods.

One must also know something about the value of money, i.e. know more or less how much one can buy for different sums of money. People with B-level intellectual handicaps can learn to identify the different value notes. They can also learn that a hundred crown note is worth more than a fifty crown note, etc. On the other hand, it can be difficult for them to know what they can buy for, e.g. a hundred or fifty crown note, i.e. it is difficult to know what articles the money will buy. This problem is caused partly by the design of price tags. We learn what we can buy for different sums of money by looking at different articles and finding out how much they cost. We then use this knowledge when we plan what we want to buy, and what we can afford. If articles were not marked with the price it would be very difficult for us to get an idea of the value of money. Intellectually handicapped people at the B-level are usually unable to make anything of the information on a price tag. They can't express the sum on the

tag in terms of money. If, instead of using numerical symbols, the price tags were marked with pictures of the notes required to buy the article, it would be easier for many intellectually handicapped people to understand the value of money.

Knowing how much money you have

In order to manage your own affairs, you must not only have some understanding of the value of money, but also know how much money you have. There are various ways of getting this information: the most concrete, and also the simplest, is to have the money in your hand, but you don't usually keep all your money at home, you usually have a bank account. Information about how much money you have in the bank is given in the form of figures in your bank book or figures on a withdrawal slip. The same information is usually on your pay slip, your pension slip or bank card slip. All B-level intellectually handicapped people find it difficult to understand that the figures on their pay slip, in their bank book, etc., symbolise money. They may be able to read the sum, but they do not understand that it represents a certain number of notes and coins. It may even be difficult for people at the C-level to get a clear idea of, for example, how much money the figures on their pay slip represents.

To understand that the figures on your pay slip or pension slip, in your bank book, etc., correspond to a certain number of notes and coins requires a relatively high level of abstraction. Pay slips, bank books, cash withdrawal slips, etc., are symbols for money, and money is in turn a symbol for the goods for which you can exchange it. In order to understand information, you must first understand a symbol that represents a symbol, which is difficult for many intellectually handicapped people. If the figures bear no visual resemblance to the notes or the coins, it is difficult to link numerical information with a certain sum of money. This means that intellectually handicapped people must have some other aid than, for example, their pay slip if

they are to understand how much money they have; the information on how much money they have must be given in a more concrete fashion. As mentioned earlier, the most concrete form this information can take is to have the money in your hand. Many intellectually handicapped people would form a clearer idea about how much money they have if they were given help in drawing their entire salary/pension and had the money in their hand. Another way of simplifying information is, instead of using semantic symbols (numbers), to transfer the information by using pictorial symbols. This would mean reproducing the number of notes which corresponds to the sum required: small sticky labels in the form of different value notes could be used.

One way of giving intellectually handicapped people a better idea of how much money they have is to use pictures to reproduce the number of notes corresponding to the total sum.

> Lars attends a special training school class. He and his classmates are going to a camp and they are collecting money. The teacher has applied for grants from various funds and one day they receive a postal order for 3.000 crowns from a fund.

The teacher tells them they have received 3.000 crowns for the summer camp; that they can exchange the green postal order for 3.000 Crown notes at the Post Office, that he has to write his name on the green postal order form and that identification has to be shown. He also explains that he will then go to the bank to deposit the money in the summer camp account. Lars is given the job of taking the bank book, the folder in which they have stuck pictures of notes to show how much money they have saved, and the sticky labels representing banknotes. They go to the post office together, and when the teacher has cashed the postal order for three 1 000 crown notes, all the students touch the notes and count them. At the bank, the teacher fills in a deposit form and Lars produces the bank book, the folder and the sticky labels. Then they talk about how to fill in the form, look at the sticky labels and choose three 1 000 crown note labels and stick them in the folder. The teacher then explains that they have to go to a cashier's window and have the sum entered in the bankbook. When they get back to the classroom they look at the folder and see how much money they have, count the labels representing various notes and discuss how many more notes they need.

Planning a personal budget

If you are going to keep to a personal budget, you need to know how much money you have and how long your money has to last for. Most payments are made monthly, so you must have a conception of time which understands a month, so that you know how much to spend and on what. You must know how many times you are going to eat, go to the cinema, etc. in the course of a month. Many intellectually handicapped people have difficulties in planning an entire month and have no understanding of how long the money is to last for, so they need help in allotting money to different items. We plan our budgets on the basis of our

payslips, bills and so on and keep an account of how much we spend on food etc., all of which means that we must understand symbols which stand for other symbols, we must have a well-developed understanding of time and quantity and that we can write. Intellectually handicapped people at the B-level, and even some at the C-level, need concrete aids in planning their budgets. Instead of writing their expenses as items in an accounts book, they can use envelopes marked with pictures, instead of bills and written entries indicating how much money to spend on different items, they can mark envelopes with sticky labels representing money. Instead of pay slips they can put real money in the envelopes.

However, intellectually handicapped people still need help in planning their finances and they are dependent on someone to explain their regular expenditures such as the rent, the electricity bill, water rates, telephone bill, etc., someone who knows when these bills are due and can plan a budget, someone who tells them what they can do with their money and how a certain choice might affect their budget, etc. If they do nothing more than discuss it, intellectually handicapped people might find the subject too abstract. Instead, as mentioned earlier, the discussion should be based on real money, pictures, sticky labels depicting notes, and envelopes.

When intellectually handicapped people get their salary/pension, they should be accompanied to the bank or post office to withdraw the full sum. On returning home, they should be helped to divide the money into an envelope for the rent, placing the same number of notes in the envelope as are represented on the outside. The intellectually handicapped person can also be helped to calculate how much he needs to put aside each month for other fixed expenditure which is not monthly, but perhaps quarterly; each item having an envelope with the right number of notes represented on it. The envelope should also have a picture on it to help the intellectually handicapped person understand what the money is for.

Then plans can be made for spending whatever is left. For intellectuallly handicapped people who find it hard to have an overview of the full month, planning is made easier by dividing the remaining money into four equal parts, one for each week. Three piles of money are put to one side and plans are made for one pile. One can discuss with the intellectually handicapped person what he or she wants to do in the coming week, the price of different articles, the economies which can be made in order to buy something special, etc. Many intellectually handicapped people have limited experience of what money will buy, and may need some guidance.

When the intellectually handicapped person has decided how he wants to apportion the week's money, it can be put in different envelopes. Each envelope is labelled with a picture, or something similar, so that the intellectually handicapped person knows what the money in that envelope is to be used for. If there is some money left over it can be taken to the post office or the bank where any bills can be paid, and the rest put into a bank or post office savings account. The following week he can be accompanied to the post office or the bank to take out that week's money, repeat the planning procedures, put the money into different envelopes etc.

Financial transactions

An understanding of banking procedures requires a well-developed intellect. Intellectually handicapped people at the B-level can therefore hardly be expected to manage the system on their own, even if they have access to certain aids. They can, however, experience a greater degree of independence, even if they will always be dependent on help from another person.

Handling one's personal finances oneself requires the ability to separate payment-in and payment-out forms from the rest of the post and separate them one from another, one must be able to pay bills and

deposit and withdraw money from the bank, the post office, etc.

Since we can read, we can separate payment-in and payment-out forms from the rest of the post, and from each other. We can also separate the payment-in forms that are sent us with advertising offers from bills which we have to pay. People at the B-level, and even some people at the C-level, have difficulties in recognising payment-in and payment-out forms and separating them from the rest of their post. This is partly because many of them have reading difficulties and partly because these payment slips are symbols of symbols, which has been described earlier. It would be much easier for these people if these payment slips were clearly identifiable, e.g. by using a colour code, thus making them stand out from the rest of the post and from each other. This code could be used only for bills which must be paid, and not for the kind of payment form that accompanies direct mail advertising.

Since we understand numerical information, we can understand how much money has been sent us or that we must pay in. Many people would find this easier if the sum was also represented with pictorial symbols of the number of notes that corresponds to the sum payable. As an alternative, an intellectually handicapped person could be given help to stick onto the form labels depicting the number of notes he needs in order to carry out the transaction. He would then still be dependent on help, but it would give him greater independence and a sense of being in command of the situation, since he would then know how many notes, and what type of notes, he must either pay in or expect to receive.

To cash a payment slip at the post office or bank, you must be able to write your name. For those who have difficulties in doing that, an individual stamp, which is also on their identity cards, would be a great help. When depositing or withdrawing money at the bank or post office you also have to write in capital letters your name, telephone number or address, your account number and the sum you wish to

deposit/withdraw. Again, a stamp with this personal information and the account number, would make it far easier for intellectually handicapped people to perform this action. This would require that these forms were designed to take this stamp, at the post office and all banks. The intellectually handicapped person could then fill in the required sum by sticking pictures of notes onto the form. It is also important that the forms themselves are easily distinguishable from one another by, for example, using a uniform colour-code system.

Even the intellectually handicapped who can read and write would benefit from having the language on the forms simplified as much as possible, so that a greater number of people would be able to fill in all these different forms.

Making withdrawals, deposits, and paying bills also means that you must be able to find the right window at the counter. At Swedish post offices there are signs above each window, on which are written the transactions that can be done at each window and this information is given not only in writing, but also in colours. All post offices apply a uniform colour-code system; white signs for information, green for all transactions, blue for deposits and withdrawals, yellow for parcels and suchlike, and red to signify position closed. This makes it very easy for many intellectually handicaped people to find the right queue. Now that a queuing system involving numbered tickets has been introduced in many banks and post offices, a lot of intellectually handicapped people are no longer able to perform these actions. They would be helped if each bank and post office had at least one window which did not require a queue ticket, but at which one could stand in a queue. This window should also be marked with its own colour.

Summary: if you are to manage your personal finances, you must have some idea of the value of money, how much money you have, and how long this money has to last. If information were provided in a way that intellectually handicapped people could understand, among other

ways by using pictorial symbols instead of semantic symbols, they would be able to manage their personal finances without being dependent on help from others.

In addition, one must be able to read and write to withdraw and deposit money and pay bills. Many handicapped people would find it easier to distinguish between payment-in and payment-out forms, and separate these from the rest of their post if they were clearly marked with a colour code. A uniform colour system on bank forms would make it easier to choose the correct form. Personalised stamps with personal information, name, account number etc., would be a useful aid for people who cannot write. This choice of window at the post office is simplified if written information is supplemented with colour code information, but is complicated by the introduction of numbered queuing tickets.

SHOPPING

What can one buy?

We buy things because, in one way or another, we need them. This means that you have to know what to buy to serve a given purpose. An acceptable level of understanding of quality and cause and effect gives you some understanding of what function a certain article has, even if you yourself have no first-hand experience of the article in question. We have, in other words, some understanding of what articles are available in the shops, and what purpose they serve. Intellectually handicapped people at the B-level never think about things they don't have first-hand experience of, so it is difficult for them to understand the enormous range of goods available. This, added to their limited comprehension of cause and effect, also means that it can be difficult for them to know that they can buy something to serve a particular purpose.

> Eva grew up a large institution, where she lived for a long time. She has been living in a group home for about a year now. One day she complains that her hands are sore and feel rough. One of the staff then says to her that she should buy some hand lotion. "Really?" Eva says and looks at her inquiringly, "Where can you buy that?" she asks.

Eva didn't know that you could buy a preparation to make your hands smooth and soft again and she can only learn this by first-hand experience of buying hand lotion, rubbing it into her hands and feeling the effect. In this way she can learn that if her hands are rough, she has to buy hand lotion. This means that intellectually handicapped people need a wealth of first-hand experience in buying the articles they need when they need them (with, of course, any help they may require in doing this). This way intellectually handicapped people can get first-hand experience of cause and effect between a particular need

and a particular article.

Eva's hands are rough. She didn't know that hand lotion could help this condition. Now she has learned where to buy it and how it is used.

What do you need to know to go shopping?

The demands made on shoppers have changed over the last 30 years. We used to have to go to the shop which sold the article we wanted to buy. Once in the shop we had to tell the assistant what we wanted, for example by speaking or handing over a shopping list. The assistant then produced the article and told us the price, we could ask advice about the quantity we needed or an alternative to the article asked for if supplies had run out.

We still have to find the right shop, but once inside, we have to find the articles ourselves, take them off the shelves and read the price. If we want help, we have to find an assistant and ask. Then we have to find our way to a cash point where we pay. Thus, shopping places greater demands on people now than it used to, because shop assistants did most of the work in the old days. What does this mean for a person who is intellectually handicapped?

What to buy in different shops.

An understanding of quality, and the ability to sort into main and sub-groups is essential if we are to understand where to go to buy different articles: a paint brush, for example, belongs to the painting equipment category, and is sold in ironmongers. This also applies to department stores, which are divided into music departments, china departments, clothes departments, etc.

A general understanding of quality helps us to know which shops stock a certain article, even if we haven't bought that article before and therefore have no first-hand experience of where to buy it. Intellectually handicapped people at the B-level have not developed a general concept of quality. They simply arrange their first-hand experiences in different groups and these experiences can be difficult to arrange in different main and sub-groups. This means that intellectually handicapped people at the B-level must be given a wealth of experience of buying various articles in different shops. It is possible that a better understanding of what different shops sell could be inculcated by using boards on which are mounted pictures of the shops' names, making sure that these are exact replicas of the actual shop signs. Under the pictures of the shops' names one can glue the packets of the articles that were bought in these shops. Another factor which prevents an understanding of what can be bought in different shops is that certain shops extend their range of goods, while others specialise in a very few lines. This means that knowing which main group the article belongs to is not enough. One also needs to know what type of article it is in relation to other articles in that group in order to know which shop may stock what you want.

Gramophone records, for example, can be bought in a number of department stores, in some photography shops, in some bookshops, petrol stations, and record shops with a full assortment of music or which specialise in a certain type of music, e.g. classical music, and you choose which shop to go to depending on the type of music you want to

buy. If it is a record which is commonly available, you may try a photography shop. However, if it is an unusual record, one may need to go to a record shop which specialises in that kind of music, etc.

Not all photography shops, department stores, etc., sell records which, of course, makes it even more difficult for many intellectually handicapped people. In order to understand and cope with this type of system, one must have a well developed conception of quality where one and the same thing may very probably belong to several groups at the same time.

Finding your way around the shops

It used to be the shop assistant who fetched your purchase; now you have to find it yourself. To help us find our way around the shops there are different systems which tell us where different articles are; however, all these systems are based on written information. People who cannot read will therefore find it difficult to find their way in some shops, particularly in large department stores where it is impossible to get your bearings if you can't understand the information on their information boards telling you on which floor the various departments are. It may well be difficult to find where to buy a certain article if you ask your way, because the answer is often something like "On the third floor" and the location of the third floor is, of course, marked with a number.

Many intellectually handicapped people have difficulty in understanding words and numerical symbols, so this information does not help them to find their way. However, if each floor number was colour-coded, it would be easier for intellectually handicapped people to find their way, since they could ask for help at the information desk and be given information in a form they can understand.

The information boards' written information about where to find

different articles is, as mentioned before, incomprehensible to intellectually handicapped people at the B-level. They would, however, be helped by a system of colour-coded floor signs corresponding to the numbers on each floor, supplemented with small pictures of the articles on sale. In the section on cooking, there are more details on how one can, by use of colour codes among other things, help intellectually handicapped people find the right group of goods in a food shop.

Finding the right make.

Various problems arise when choosing your purchase, depending on what it is you are going to buy. When buying clothes, for example, you have to know what size you want; when buying pre-packed goods, you have to choose a package which contains the article you want. The leisure activities chapter describes the problems that intellectually handicapped people encounter when choosing records or music cassettes. Information on size is usually supplied in numerical form. Some shops, however, have introduced a colour-code system where sizes are coded by coloured bands around the clothes hangers. If this system was standardised and put into general use, many intellectually handicapped people would be able to find the right size of garment without help. Such a system could also be applied to shoe sizes.

It is not always easy to find out what a package contains if you can't read. The co-operative movement's plain blue-and-white packaged low-price line is confusing for many intellectually handicapped people. A clear picture of the contents of the package must supplement written information before intellectually handicapped people can receive information equivalent to that given to literate people.

Another modern method which is an obstacle for intellectually handicapped people when shopping is the fruit and vegetable scales that have been introduced in the food halls of a number of department stores. The shopper weighs the fruit or vegetables himself and affixes

a printed price tag. But he has to be able to read the labels on the buttons on the scales and press the right button. If, instead of words, the buttons on the scales, had pictures of the fruits and vegetables, intellectually handicapped people who have difficulties in reading would be able to cope with this system.

The personal service at the meat, fish and cheese counters can also present problems for people with intellectual handicaps, since they usually have to take a numbered queue ticket, which means they need to understand numerical symbols; something that many intellectually handicapped people are unable to do. This system of queue tickets prevents many intellectually handicapped people from shopping in this way, which presents no other problems, since the assistant does everything that would otherwise cause problems for intellectually handicapped people.

In itself, an intellectual handicap should not mean that it is difficult to understand the price of an article. But, this information is only availabe in a form that is incomprehensible to people with intellectual handicaps. That the numbers on a price tag represent a certain number of notes and coins is difficult to understand. If, instead, the price tags depicted the notes and coins which would correspond to the price of the article, it would be far easier for intellectually handicapped people to make purchases and pay for them (see the section on personal finances).

Business hours

Knowing whether the shops are open or closed at any given time is a simple deduction. Many intellectually handicapped people can understand this and similar cause and effect relationships, but many of them lack the experience they need to establish a relationship between the time of day and whether the shops are open or closed. Many intellectually handicapped people often go shopping with someone to

help them, i.e. their shopping trip is planned in advance and, quite obviously, one does not plan a shopping trip when one knows that the shops are closed.

Summary: The reason for buying an article is that you need it. That is to say, you have linked a certain need with a certain article which will produce the desired result. Before they can understand this kind of cause and effect relationship, intellectually handicapped people need a lot of first-hand experience of buying different articles themselves, at the time they have need of them.

It is difficult for many intellectually handicapped people to know which shop to go to to buy a certain article, since this requires a highly developed conception of quality, an understanding which may possibly be easier if, when you have been shopping, you glue the packets of the articles you have bought on boards, under a picture of the names of the respective shops.

If information is to help intellectually handicapped people at the B-level as much as it helps us, it must be supplemented with pictures and a colour-code system.

The more functions that are transferred from the shop assistant to the customer - finding the right article, weighing fruit and vegetables and marking them with the right price, etc., the greater the demands that are made upon the customer's abilities and the more difficult it is for intellectually handicapped people to go shopping without being dependent on other people for help.

CATERING FOR ONESELF

The purpose of teaching intellectually handicapped people to cook must be to make them as independent as possible of outside help in this area.

Even if they use several different aids, many intellectually handicapped people will never be able to overcome the numerous difficulties involved in producing a cooked meal from raw ingredients. They may need to buy convenience foods if they are to feed themselves without help. However, intellectually handicapped people must first have learned, for example at school, how to serve ready-to-eat or partly-cooked dishes, because the instructions are in writing and can be difficult to understand, even for people who can read. Simplified instructions would, of course, give intellectually handicapped people a wider choice of pre-cooked food.

The information they find difficult to understand primarily concerns the quantities stated in some preparations, the times and the instructions about cooking temperatures.

Quantities can be simplified by introducing standardised measures where the quantities teaspoon, dessertspoon, decilitre etc, have a certain colour. Written information can be supplemented by pictures of the measures required and a picture of whatever needs to be added; this is usually water, and a picture of a running tap would be understandable to an intellectually handicapped person at the B-level. People at the B-level can't tell the time and so a kitchen timer is no use to them, since they can't set it. A 60 minute timer equipped with different coloured buttons, e.g. one for each ten minute interval, would, on the other hand be a useful aid. The written instructions on the packet could then be supplemented by a picture of this timer where the right time for, e.g. cooking in the oven, is given by indicating which button on the timer should be pressed.

The act of setting the oven temperature requires an understanding of numbers. Later in this section, there is a description of how oven settings, among others, can be simplified by replacing numbers with simple perceptual symbols such as a circle, a triangle, a square, etc., which can be used to supplement the instructions about oven temperature on the packet. Even if the instructions are simplified as described above, intellectually handicapped people must be taught to follow them, for example at school.

When you have no conception of what the result can be, the will to do something is weakened. When some residents of a group home were going to make lasagne, they thought that the name of the dish was strange, and that the ingredients were difficult to imagine as a cooked meal, so they were not interested in cooking the dish.

The will to do something is, as described earlier, strongly related to the expected reward. Intellectually handicapped people at the B-level have difficulties in imagining things that they haven't had first-hand experience of. It can, for example, be very difficult to imagine, on

the basis of familiar ingredients, what the finished meal will taste like if you have never tasted it before, because this requires a highly developed concept of quality as well as the ability to perform a sequence of thought operations. This naturally affects the will to try out new recipes. Possibly the will to try new dishes could be stimulated by discussing the recipe while showing a picture of the dish, as this would convey some idea of what result to expect.

An example of this lack of understanding of what result to expect affecting the will to perform the action occurred when some people living in a group home were going to cook vegetarian lasagne. Not only did the name of the dish seem strange to them, but they didn't know whether they would like that kind of food as they couldn't imagine what it would taste like simply by looking at the ingredients, and therefore were not particularly interested in preparing it. By comparison, their will was completely different when, on another occasion, they were going to make pizza: this time they knew what the result would be - they had eaten pizza before and liked it.

Planning and arranging meals.

If you are to do your own catering, you must not only be able to cook several dishes, but also be able to plan and arrange what to eat over a period of, for example, a week.

When we settle on a dish to cook we want it to meet certain conditions, for example we want it to taste good, to be inexpensive, quick to prepare, nutritious, be different from what we ate earlier in the week, light or heavy, etc. We compare in our minds different dishes to see whether they meet these conditions, and this requires the ability to perform certain thought operations. In addition, a highly developed conception of quality is needed to sort these dishes into groups in which all dishes have something in common, e.g. they are cheap, they are fun, thay are quick to make. If we can't think of anything to eat

ourselves, we sometimes get ideas from cookery books. But, to do this we have to be able to read and, as described earlier, imagine how a dish will taste from a knowledge of the ingredients, i.e. we have to make an estimation of quality.

There are many dishes that are difficult for intellectually handicapped people to categorise in this way. To choose a dish on the basis of the characteristics of different groups of food can therefore be difficult. A collection of pictures of different dishes would help intellectually handicapped people to understand what alternatives they have and thus help them to make a choice. Even if intellectually handicapped people often find it difficult to consider the financial and time aspects etc. in their choice, it is important that it is **their** preference of food, e.g. that it must taste good, which is met, and not our demands that it must be quick to prepare, be cheap, etc. Perhaps it would be easier for an intellectually handicapped person to take such aspects into consideration if the pictures were arranged in groups such as inexpensive food, food which is quick to prepare, party food, etc.

Preparing a meal.

Arranging meals without outside help means that, having decided what to eat, one must be able to buy the ingredients and prepare the food, which in turn means one must know what the ingredients are and what quantities of them are required.

We find this information in the recipe, but the person who can't read needs photographs of the ingredients. As a suggestion, there could be a photograph of each ingredient in the recipe on the same page as the picture of the cooked meal. These photographs would also help people understand how much to buy, e.g. the photograph could be of two onions. If the quantities ae given in hectograms/kilograms or decilitres/litres, it will be difficult for an intellectually handicapped person to know how much to buy. The problem of

understanding measures given in hg/kg can in some cases be resolved by adding to the information about the quantity in a packet a picture of the number of people the dish will serve, for example mince 300g. This would mean that a recipe's list of ingredients need only contain a picture of the ingredients and the same picture of the number of people as on the labels of the food packets. A one decilitre measure can often be illustrated with a picture of the standard 1.5 decilitre packet of whipping cream, a picture of a meat cube etc.; this type of information is enough to do the shopping with. These pictures not only provide information about what and how much to buy, they can act as reminders which intellectually handicapped people can take with them to the shops instead of the reminders that we write out in the form of shopping lists.

There are already cookery books on the market with pictures of the cooked dish and the ingredients it is made from, but the main purpose of these pictures is to make the cookery book aesthetically attractive. The pictures of the ingredients give no indication of, for example, how much of each ingredient is used in the recipe and some of the ingredients may be partly hidden. Full details of the ingredients and quantities is provided in the written recipe. The illustrated pages in these cookery books cannot be taken to the shops as reminders. This, together with the fact that in spite of the pictures most of the information is given in writing, means that intellectually handicapped people at the B-level cannot use these cookery books. However, as described above, the changes that need to be made so that they could be of use to intellectually handicapped people are relatively few.

There is a more detailed description of the problems intellectually handicapped people meet when they do shopping in the section on shopping, so very few of them are covered here.

Most intellectually handicapped people find it difficult to estimate how much the ingredients are going to cost and how much money they may need (see the section on personal finances). A very rough idea of the

cost of the goods can be given by illustrating the recipe with the number of notes corresponding to the estimated cost of the dish. Changes in price can be marked if small sticky labels representing different value notes are used so that intellectually handicapped people can be helped to glue in the right values when prices change.

Written signs telling us where to find different groups of products help us find the goods that we want in shops, provided we are able to read and classify the goods in different groups. Some intellectully handicapped people would be helped if the signs included pictures of the goods. Other intellectually handicapped people might even require help in classifying the goods in different groups. These product groups and the articles which are included in them are usually the same from store to store so you normally find flour, oats, sugar and salt on one display, and tinned vegetables on another, etc. Thus it is possible to indicate in the recipe which product group the ingredient belongs to, for example tinned tomatoes are marked with the symbol on the stores' display sign for tinned vegetables. However, this information must be presented in a way that intellectually handicapped people can understand, for example, the product group could be marked with a colour code. The display signs could also be colour-coded by product group and this code could be used in the list of ingredients in the recipe. This type of information would give intellectually handicapped people the same help as we get from display signs when looking for articles in the stores.

Cooking a meal

We use written recipes to help us cook food. Intellectually handicapped people need information presented in a different way. The kind of information that would help them would be a recipe sheet illustrated with photographs showing what to do and in what order, what kitchen equipment is needed and the quantities of each ingredient that are required. There are cookery books currently available which have

illustrations of each step of a recipe, in the right order, and these could, with relatively few changes, be used by intellectually handicapped people at the B-level. The changes which are required concern mainly the details of quantities, oven temperatures and times; information which is usually presented in written form, while intellectually handicapped people need this information presented in a different way.

At the beginning of this section, there is a description of how quantities can be simplified by using measuring spoons with standardised colour codes for the different quantities. Instead of writing 2 decilitres, for example, the same information can be presented as a picture of two red 1 decilitre measures so that an intellectually handicapped person can use his red measure to measure out the right quantity. There is also a description of how a timer with different coloured buttons with each button corresponding to a certain time can be a useful aid for people who cannot use and don't understand an ordinary clock.

One must also know how to use an oven, and understand which dials control the hotplates and the oven. These dials are marked to show which hotplate they control, but the ability to perform spacial operations is needed if this information is to be understood, and this may be difficult for many intellectually handicapped people. They must be given this information in a different form if they are to match the dial with the hotplate it controls. If, for example, each dial had a colour which was matched by a colour on the hotplate, it would be easier for many intellectually handicapped people to turn on the right hotplate. An alternative solution would be to locate the dials on the top of the oven beside each hotplate. This would also reduce the risk of small children injuring themselves by playing with the stove.

The numerical symbols on the dials must also be understood. There are usually six numbers on hotplate dials, which intellectually handicapped people can usually learn to recognise, but it would be easier to set

the right temperature if the dial could only be turned in one direction so that no. 1, or the lowest temperature was always the first setting.

The oven temperatures are, however, more difficult to understand, partly because they are 3 figure numbers which are difficult to learn if you don't understand numerical symbols, but only recognise a few numbers from their graphic form, and secondly because only some temperatures are marked. For example, of you are to set the oven at 175 degrees, you must know that 175 is half way between 150 and 200, and set the dial between those two marks. This, of course is very difficult for many intellectually handicapped people. All this numerical information could be simplified by marking the important temperatures with simple perceptual symbols, such as circles, triangles, etc, so that the interval between 150 degrees - 175 degrees could be marked with one symbol, 175 - 200 degrees with a second, 200 - 225 a third, 225 - 250 a fourth, and 250 - 275 with a fifth, and could thus be used in recipes to indicate the required temperature instead of using numbers.

An intellectual handicap can make it difficult to understand the relationship between cause and effect when there is a time lag between them, and this can make it difficult to link a hot, glowing and/or cracked hotplate with the fact that it had not been turned off several hours earlier. The difficulty in understanding this cause and effect relationship means that it is easy to forget to turn off the hotplate because the importance of doing so is not understood. A warning signal which is activated if the hotplates have been on for while without having anything on them would be a useful aid.

Learning to cook

The aids suggested above are not sufficient to enable intellectually handicapped people to cater for themselves without help. They will need help and support from other people, particularly while learning to

cook. This support should aim to teach intellectually handicapped people to use a book of recipes as an aid to cooking, which is, of course, best learned by actually doing some cooking.

When the intellectually handicapped person has chosen a dish to cook, he can look at the photographs of the ingredients and discuss with his helper what the ingredients are called, whether there are sufficient quantities at home, and which ingredients need to be bought. This gives the intellectually handicapped person first-hand experience of checking what ingredients he has on the shelf before he goes shopping.

Then the prices of the ingredients are discussed and the intellectually handicapped person can, by looking at the pictures of banknotes by the recipe, see whether he has enough money.

His helper will then discuss with him the best shops to visit to buy the ingredients he needs.

By going to the shops, the intellectually handicapped person is then given first-hand experience of how to shop; that he must take a basket/trolley to put the articles in and that he then goes to a cash desk, takes the articles out of the basket/trolley, that he can buy a bag there if he needs one and, finally, that he pays for his goods.

In the shop he also discusses where to find the different articles, he looks at the colour markings of the ingredients on his "shopping list" and locates the same colours on the display unit signs. Together with a helper he discusses what quantities to buy and compares them with the pictures on the "list". When he goes to the cash desk to pay he has his "shopping list" with, as an aid, a picture of the number of notes of different values that he needs. Naturally, it would be even easier if the checkout staff were told that intellectually handicapped people find it easier to pay if instead of Kr.27.50 they are told that "it costs three ten crown notes and you will get some coins back".

Once home, they unpack the goods together and talk about what they have bought. They take a look at the recipe and set out the equipment they will need. They then look at the pictures and see what the first step is. In the early stages, the pictorial information may not be sufficient to tell the intellectually handicapped person what he should do, so we must supplement it by acting as models and demonstrating what to do. The same procedure can apply to the other pictures in the recipe; talking about what to do, discussing quantities, temperatures, and the times given in the recipe.

Summary: Different types of ready-made foods can act as aids to help many intellectually handicapped people cater for themselves without help. The instructions, particularly referring to timing, temperatures, and in certain cases quantities, need to be changed if they are to be understood by the intellectually handicapped.

A cookery book made up of recipe sheets which can be removed and which gives details of the ingredients, quantities, method of cooking, and the finished dish in pictorial forms and simple perceptual symbols instead of as a written text would be a useful aid in cooking. The timers, oven and measuring spoons must be modified so that intellectually handicapped people can understand them and use them. In their present form, many intellectually handicapped people cannot understand the information they provide.

THE LAUNDRY

Motivation

A goal-directed will to wash clothes is generated when our sensory perceptions, which are interpreted by the intellect, tell us that our clothes are smutty and smell bad; this produces the will to have clean clothes which don't smell. Our knowledge of the goal and the reward tells us that washing clothes makes them clean which means they don't smell, which finally produces a goal-directed will to do the laundry.

It is thus essential to understand the relationship between cause and effect: "washing dirty clothes makes them clean". However, this cannot be understood unless a difference is perceived between the condition of the clothes before and after washing them, which in turn means that one must learn to look for grime and stains on clothing, see if they smell of sweat, and so on. One must also look at clean clothes, see that they don't have any stains, check that they smell good, etc. The more tangible the experience of the relationship between cause and effect, the easier it is to understand. In this case, therefore, one should not begin by using a washing machine, but by doing the washing by hand, so that the effects of rubbing and washing a stain can be seen as the stains disappear, the under-arm sweat smell can be observed at first hand to disappear, etc. When washing, the important thing to emphasise is the link, for example, stain - washing - no stain, and that it is the intellectually handicapped person himself who decides at what point the dirt and odour has disappeared.

The will to wash is best stimulated in natural situations. The goal-directed will is stimulated by direct participation in all stages of the laundering process.

The training aims partly to teach intellectually handicapped people to judge for themselves when clothes are dirty, and partly to teach them

about the goal (washing) and the reward (clean clothes).

Having learned the relationship between dirty - washing - clean, and thereby instilled the motivation to do the washing, one can begin to use a washing machine. The cause and effect relationship is easier to understand if the machine has done a load of washing while the exercise of washing by hand was being carried out. When stimulating the motivation to use the washing machine, it is important that the initial result is not a negative one, i.e. the clothes should not shrink, become discoloured, or the washing machine seem to be difficult to use. To start with, intellectually handicapped people should only help with loading the machine and hanging up the clean wash before gradually learning to perform every stage of the washing process themselves.

When to fit in the washing.

Choosing a suitable day and time for doing the laundry is necessary if you are to keep your clothes clean without help from others. When using a washing machine, you also have to be able to choose the right programme. Choosing the best time to do your laundry means that you must know how long it takes, know what other activities are taking place during the week and when, and, finally, you must be able to work out when to fit in the washing. This requires a conception of time sufficiently developed to understand clocks and the ability to estimate both points in time, the duration of an activity, as well as an understanding of weekdays and weeks: thought operations are also needed, among other things, to work out when you have time to do the washing. People at the B-level have difficulties in doing this, and need help in deciding when to fit in the washing.

Intellectually handicapped people could manage this relatively independently if they had as an aid a calendar with the relevant weekday marked with a picture signifying laundry. The intellectually handicapped person could be given help in deciding which day is the

most suitable to do the laundry on and the picture could be put up next to that day (see time aids).

Choosing the programme

The other choice you face when doing the washing is choosing the delicates, coloureds or whites programme, which means you need to be able to sort clothes by fabric. It is often difficult to decide what temperature to wash different fabrics at and there are small tags in the garments which tell us the right washing temperature.

Sorting the wash requires a well-developed conception of quality and, if the tags are to be of any use, that you can read, both of which can be difficult for many intellectually handicapped people. They could, however, be helped by marking all clothes, towels, etc., with small coloured patches, for example blue for delicates, yellow for coloureds and red for whites, so that they can sort clothing by colour code. This is much easier than sorting by fabric. It should even be possible to have three laundry baskets, one in each colour, so that it would be easy to see what the biggest pile of dirty washing was and what needed to be washed.

The washing machine

Having sorted the dirty clothes, the washing itself remains to be done - **performing** the action. This requires a knowledge of the washing machine, the ability to add the right quantities of washing powder, choose the right programme, close the lid etc. Because some intellectually handicapped people have difficulties in counting, the washing powder measure should be big enough to add the entire dose in one measure. We choose the programme by reading the text on the programme selector dial, which is incomprehensible to many intellectually handicapped people, since it requires an understanding

of semantic symbols. Instead, it would be easier to set the right programme if the programmes were colour-coded in the same colours as the ribbons that mark the garments. A timer with three buttons: blue, yellow and red, would allow many intellectually handicapped people to leave the washing machine and do something else during the wash.

Why iron clothes?

Keeping your clothes clean and neat without help means that you have to be able to iron them. The goal-directed will to iron clothes is generated by having perceptual experiences which are interpreted by the intellect, received as knowledge that clothes are creased, which leads to the desire to have them smooth. Knowledge of the goal and reward tell you that the clothes will be smooth (reward) if you iron them (goal) which, in its turn, produces a goal-directed will.

The desire to iron clothes also requires an awareness of the difference between crumpled and smooth. This can be made clear by, for example, comparing a crumpled shirt with a pressed shirt and discussing the difference. The cause and effect relationship itself, i.e. if you press it, it will be smooth, is easy to understand since the reward (effect) occurs immediately after the action (ironing) which is the cause of the smooth garment (the goal). To be sure of the greatest possible reward it is, however, important that any difficulties, i.e. setting the temperature of the iron, ironing clothes that are difficult to iron, are eliminated to begin with by having someone set the iron temperature and make sure that the intellectually handicapped person only has simple things to iron, such as hand towels, handkerchiefs, etc.

Setting the iron temperature

Having decided to iron some clothes, a method must be chosen. Steam

irons have eliminated the need to decide whether or not to moisten the garment, the only thing that needs to be learned is that the iron must be filled with water each time it is used. A useful aid in choosing a suitable time to do the ironing is a a calendar on which one can glue pictures, as with the choice of washing day.

If you are to manage the ironing on your own, you must also be able to select the right temperature setting. We have learned to choose different temperature settings for different types of fabric, but it can often be difficult to do this with nothing else but the type of fabric to go on. Many garments have small tags sewn into them with information about ironing, some clothes also have small dots which corrrespond to the dotted markings on irons for temperature settings. The first type of information requires an understanding of semantic symbols both to read the information on the clothing tags and also on the iron itself; the second type of information, using dots, is much easier to understand. If an intellectually handicapped person's clothes are clearly marked using the dot system, for example on the colour code patches, which correspond to the dotted markings on the iron, many of them would manage to make the right temperature setting.

The importance of selecting the right temperature setting can often best be taught by trying to iron with an iron which is cold and then with an iron which is too hot, so that one gains first-hand experience of the different results. When it comes to performing the action, i.e. the ironing, an intellectual handicap has no real effect on one's ability to iron, but, as with all other activities, it is a question of motivation and training.

Storing clean clothes.

The clean laundry must be put away in cupboards, wardrobes or drawers in an orderly fashion so that clothing can be easily found and it is easy to see what clean clothes there are. The clothes are sorted into piles by type; usually garments that have the same function are put in

the same pile, all underclothes in one pile, all socks in another, all warm sweaters in a third, etc. Arranging clothes into groups in this way requires a conception of quality, and certain characteristics of the garments, e.g. colour, are ignored. This can be difficult for some intellectually handicapped people at the B-level, so they need help in sorting clothes. If pictures are fixed to the cupboards and wardrobes to indicate where different articles of clothing are kept, it is easier to keep things tidy and find the articles you want.

> In Per's special training class students now learn to wash their gymnastics clothes in the ADL (adaption to daily living) lessons. The main purpose is to teach them to notice when their gym clothes are dirty. The students are to learn to become conscious of when their clothes need to be washed. Physical training lessons provide the opportunity to discuss and demonstrate how hot and sweaty students get. They have smelt their own bodies and clothes so that they can recognise the smell of perspiration.
>
> On the first few occasions the clothes were hand-washed. The pupils learned how much washing powder to add, and that the water had to be at a certain temperature if the clothes were to be thoroughly clean. The staff showed that a little extra rubbing was needed under the garments' arms where the odour of sweat was more obvious, and that it took extra rubbing to get rid of stains. The pupils also learned the rule that if the garments were properly rinsed there would be no soap powder left in the rinsing water.
>
> When they have begun to understand the relationship between their dirty gym clothes being clean and smelling fresh when they have hand-washed them, they can begin to use the washing machine.

The only problems that students may meet when using the washing machine

are in the choice of programme and temperature for different fabrics. These problems could be minimised by using colour-coded patches on clothes, corresponding to the coloured markings on the washing machine programme selector. The pupils must therefore also learn that it is important to look for the coloured patches on their gym clothes, and the fact that all clothes that have, for example, the blue patch should be washed together in the blue programme, should be impressed on the students.

In Per's special training class, the students have learned to notice when their gym clothes need washing. The students have smelled themselves so that they can recognise the smell of perspiration.

Summary: The will to wash clothing is stimulated by the understanding of the relationship between cause and effect, that when I wash dirty clothes they become clean. This is best understood if the student hand-washes his clothes to gain the first-hand experience that stains and odour disappear in the wash.

A useful aid when choosing a time for doing the laundry is a calendar on which wash day can be marked with a suitable picture.

The correct choice of programme can be made easier by marking clothes etc. with different coloured patches corresponding to the colours marked on the different programmes. If laundry baskets in the same colours were provided, it would be easy to see which type of clothes formed the biggest wash. A timer with buttons using the same colour code would help many intellectually handicapped people to time the machine's programme and know when the wash is finished.

The dots on clothing tags which correspond to the dots on an iron can help to set the right ironing temperature. Pictures on wire baskets, shelves etc., in cupboards and wardrobes help when sorting clean clothes.

PROBLEMS IN PUBLIC PLACES

Public lavatories

Since intellectually handicapped people at the B-level do not think about things that they have not experienced at first hand, they must be shown where to find public toilets, for example in restaurants, cafeterias, libraries, railway stations, etc. This process of learning can be made easier by mentioning, whenever someone needs to go to the lavatory, where they can look for public toilets.

Arrows and signs, usually in written form, help us to find public lavatories. These notices are only helpful to intellectually handicapped people at the B-level if they are supplemented by pictorial symbols; written information on its own will not help intellectually handicapped people find the lavatory, and pictorial signs must supplement the notices marking Ladies and Gentlemen's lavatories. The vacant/engaged signs on lavatory doors are easier to understand if they are coloured white/red instead of using written information only.

Many men's public lavatories are equipped with both ordinary toilets and different kinds of urinal. Many intellectually handicapped people are not able to divine what a urinal is used for; they need to be told what a urinal is and shown how to use it.

> Tommy is having a cup of coffee with his teacher in a cafe. Before they leave, Tommy needs to go to the lavatory. He goes to the lavatory and stays there a long time. The teacher, who is a woman, grows worried and asks a man who is leaving the toilets if he saw a boy in there. The teacher hesitates to go into the men's toilet. When she finally does go in, she sees Tommy standing staring at a urinal, something which he probably doesn't recognise or know how to use.

Some public conveniences are pay toilets with written instructions on a notice. Supplementary information in the form of pictures would help many intellectually handicapped people: a picture of the coins needed and a clear diagram of where the coins should be fed in and how to push the handle to open the door. The last instruction is essential, because the procedure of producing the right coin and putting it into the slot is so different from the normal door-opening procedures that it is not self-evident that the next step is to depress the handle. After all, some doors open by themselves (often in department stores), some open when you press them, etc.

Written information must be supplemented by information in the form of pictures, even for the Ladies and Gentlemen's lavatory door signs.

Difficulties are caused for intellectually handicapped people by the different designs of locking, flushing and soap and hand towel equipment. Among other things, an intellectual handicap makes it

difficult to separate ideas, i.e. abstraction; instead intellectually handicapped people fasten on the actual design of an object which, of course, causes problems when the design is changed. Clearly visible and uniform locks, flushing, and soap and drying facilities would help intellectually handicapped people.

Entry phones, coded locks, lifts.

Some apartment blocks have installed entry phones or numerical coded locks at the street door. One must be able to read the information - either in the form of numbers or letters - beside the buttons to find out which button to press. This type of lock is a problem for intellectually handicapped people who can neither read nor understand numerical symbols.

Entry phones at the doctor's, dentist's, etc., can mean that an intellectually handicapped person who can cope with all other aspects of, for example, visiting the dentist, cannot go there alone because he or she needs someone to help with the entry phone. A uniform pictorial symbol system for public places which could complement the written information on entry phones would help many intellectually handicapped people when they are visiting someone who lives in a house with an entry phone. The button to be pressed can be marked, for example, with some coloured tape. The intellectually handicapped person who has been told that he must press the button next to the coloured tape can manage to get in without help. Each key on the electric lock's keyboard is marked with a number and, if you understand numerical symbols, it is easy to learn the code and use it to open the door. You can also write the numbers down and press the right sequence. If you don't understand numerical systems, it is difficult to learn the code by heart, because the numbers have no meaning to you: they are simply a combination of sounds. It is even difficult to match the numbers on a piece of paper with the numbers on the keyboard, because the numbers on the note will look quite different from the numbers on the keyboard.

For this reason, it is difficult for people at the B-level to visit people who live in houses with front doors which have number-coded electric locks. It might be easier for them to learn the code if it was illustrated on sheets of paper on a pad, where each page had a picture of the keyboard with one number marked with a colour. Constant training of a single number code will also teach the keys' spatial relationship to one another, which means that you could learn not to press a certain key because it has a certain number on it, but because it is in a certain place on the keyboard. This way of learning a number code is easier for many intellectually handicapped people because it doesn't require an understanding of numerical symbols.

As with the entry phone, a lift can only be used if you can understand written information and recognise different numerical symbols, so that you know which button to press in the lift. Here too, a uniform system of pictorial symbols for doctors, dentists, etc., should be introduced. These symbols, placed beside the relevant button on the lift, would help intellectually handicapped people who cannot read to press the right button.

Even if you understand which floor to go to, information such as "go to the 2nd floor", can be difficult to transfer to the right button in the lift. If the lift buttons were marked with symbols for each floor, intellectually handicapped people would be able to press the right one. This system is already in use in some modern housing areas.

Summary: Public places are designed by and for people with a normal intellect, and usually presuppose an understanding of semantic symbols, i.e. information is given in the form of text and numbers. People who cannot understand semantic symbols, such as intellectually handicapped people at the B-level, thus get much less help from these signs than people who understand semantic symbols, who, for example, can find lavatories, know how much it costs to go to the lavatory, can find a hand towel and soap, which are often cunningly concealed in public toilets to look smarter, can press the right buttons on entry phones, coded electric locks and in lifts.

Information given in semantic symbols must be supplemented with pictorial symbols if intellectually handicapped people at the B-level are to receive the same help as we do in coping with various facilities in public places.

CONCLUSION

In this document, the Institute for the Handicapped has attempted to highlight some of the problems caused by an intellectual handicap, and to suggest ways of providing different types of support. As do people with a normal intellect, intellectually handicapped people require aids to run their daily lives. If I can't grasp the concept of time, I need an aid to do so. If I can't understand the concepts of space, quality, and quantity, or cannot communicate in a way that other people can understand, I need aids. These aids must be adapted to suit my level of intellect. Intellectually handicapped people, then, need special aids (intellectual aids) for their handicaps.

If, in addition, you suffer from a physical handicap (a disability, or impaired sight or hearing), you naturally need different aids for these handicaps. An intellectual handicap cannot be compensated for only by technology, but requires special teaching methods to be applied both in person-to-person contact, and when designing and selecting aids. With the right learning methods, most multi-handicapped people who also have an intellectual handicap can learn to use the range of aids which are available today, for example electric wheelchairs, aids for the partially or wholly blind, and hearing aids for the deaf.

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ALA (adaption to life and work) is a research group connected to the National Association for Retarded Children, Young People and Adults (RFUB). The research into mental retardation conducted by ALA is mainly of a psychological/pedagogical character. It attempts to describe the nature of the handicap, its psychological effects on cognitive development, how the individual and the environment interact and how the environment should be adapted to the intellectually handicapped.

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The Swedish Institute for the Handicapped is the national body responsible for aids for the handicapped. The Institute conducts surveys, R & D, provides training and information and carries out tests of handicap aids, as well as infrastructure planning for people with reduced abilities. The institute modifies vehicles for disabled drivers. The Institute is financed by central and local government funds.